JULY 22, 1933

Railway Age

Founded In 1856

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The Need of Increased Railway Purchases . . .

RAILROADS are benefiting from improved business as much as, if not more than, any other industry. Some roads are enlarging their maintenance programs and, in particular, are speeding up their repair shop operations. As traffic continues to improve and as the fall seasonal upturn approaches, greatly increased railway purchases of equipment and materials will be necessary.

Railway buying in substantial volume will have a far-reaching effect in increasing consumer purchases, which in turn will contribute to further improvement in business and in the transportation of goods—for the purchases of railway equipment and materials will favorably influence employment and payrolls in practically every industry in the country.

The EDGEWATER RING SPRING DRAFT GEAR

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DIVISION V—MECHANICAL
COUPLER AND DRAFT GEAR COMMITTEE
Certificate of Approval for Draft Gear
Number SEVEN
Manufacturer EDGEWATER STEEL COMPANY
Type Designation of Draft Gear EDGEWATER TYPE B-32-KA
Date of Certificate JUNE 20, 1933
Issued under A. R. A. 1931
This certificate is evidence that the Coupler and D
mittee of Division V, Mechanical, American Railway
tested the above type of draft gear and approves it as
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Certified report of test of this gear, dated 6-10-33
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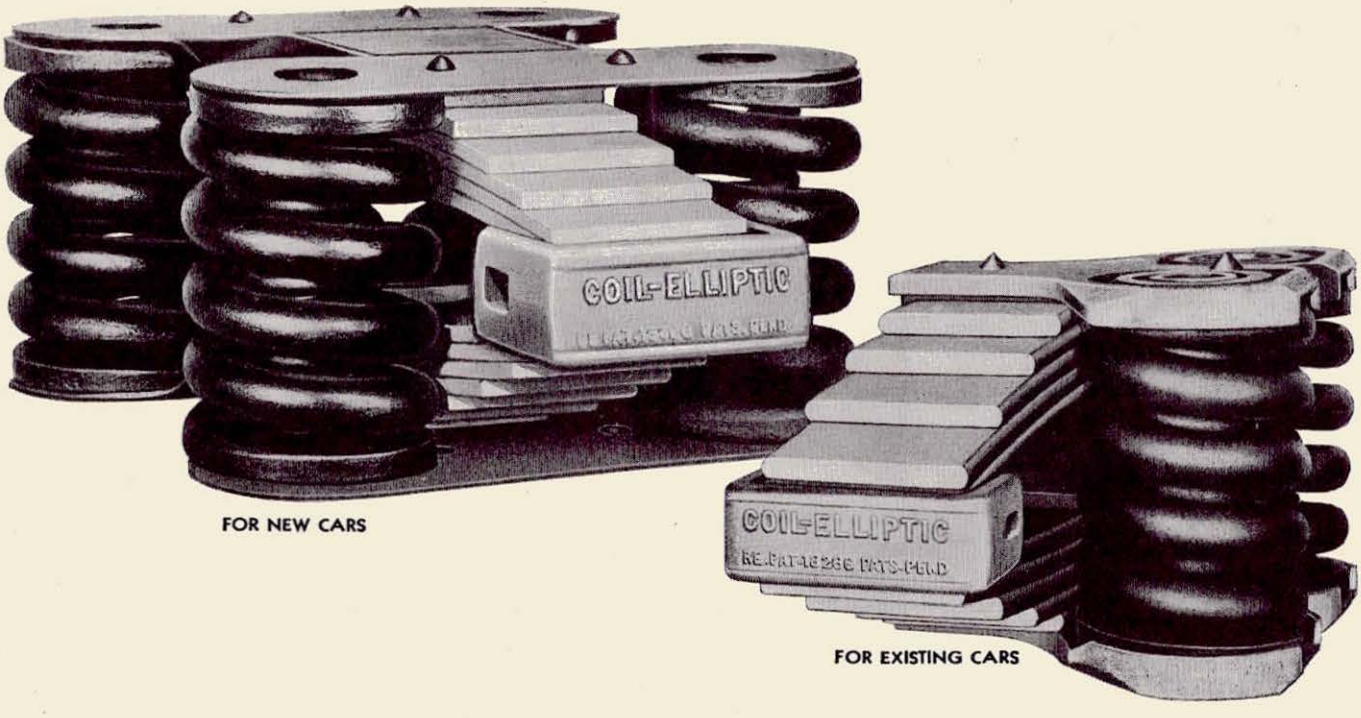
"COIL - ELLIPTIC" SPRING GROUPS Control The Bumps



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FOR EXISTING CARS

Friction between the leaves of the elliptic springs counteract and soften the violent oscillations of the coil springs.

Freight cars equipped with "COIL-ELLIPTIC" spring groups are relieved from injurious vertical shocks and carry their lading safely at all speeds.

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NEW YORK CHICAGO ST. LOUIS

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Electric Carriage

TYPEWRITER

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Vol. 95 July 22, 1933 No. 4

In This Issue

Will Air Conditioning Attract More Passengers? ..... Page 144

This is Article No. 4 of the Traffic Development Series; it discusses, among other aspects of air conditioning, the results secured from it, especially from the standpoint of its traffic-producing value.

Aluminum's Tenth Anniversary On The Railroads 147

A. H. Woollen, Aluminum Company of America, New Kensington, Pa., reviews applications in the steam and electric railway field with data showing extent of weight reductions.

Analyze Results of Pick-Up And Delivery Service 160

Tells how Boston & Maine has found that its store-door operations have prevented further spread of trucking zones and returned some business to the railroad.

EDITORIALS

The "New Deal" In Government and Business 141
Modern Spring Switches 143

GENERAL ARTICLES

Will Air Conditioning Attract More Passengers? 144
Freight Car Loading 146
Aluminum's Tenth Anniversary on The Railroads, by A. H. Woollen 147
Eastman Seeks Salary Reductions 151
Better Maintenance Will Reduce Stresses in Rail, by Dr. A. N. Talbot 153
Santa Fe Earned Charges 1.63 Times Last Year 155
Superintendents Meet at Cleveland 157

MOTOR TRANSPORT SECTION

Analyze Results of Pick-Up and Delivery Service 160
Heavy Volume of Trucked Freight Shown 162
All-Wheel Drive in Marmon-Herrington Trucks 163
New 1½-Ton Motor Trucks Offered by Dodge Brothers 163

A COMMUNICATION 164

NEWS 165

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

Three Years of Experience-

1933
A CENTURY OF PROGRESS
CHICAGO
VISIT OUR EXHIBIT
BOOTH N, GROUP 19,
MEZZANINE FLOOR,
TRAVEL & TRANSPORT
BUILDING

EVEN on the basis of the reduced traffic handled since "Union" Electro-Pneumatic Car Retarders were placed in service in February, 1930, by the Richmond, Fredericksburg & Potomac in its Potomac Yard, the installation has resulted in savings of approximately 10.7 cents per car classified.

This installation has resulted in the faster movements of perishable southern citrus fruits and vegetables and has greatly speeded up the handling of the remaining traffic of merchandise and coal.

In addition, the ability to receive and classify cars when and as

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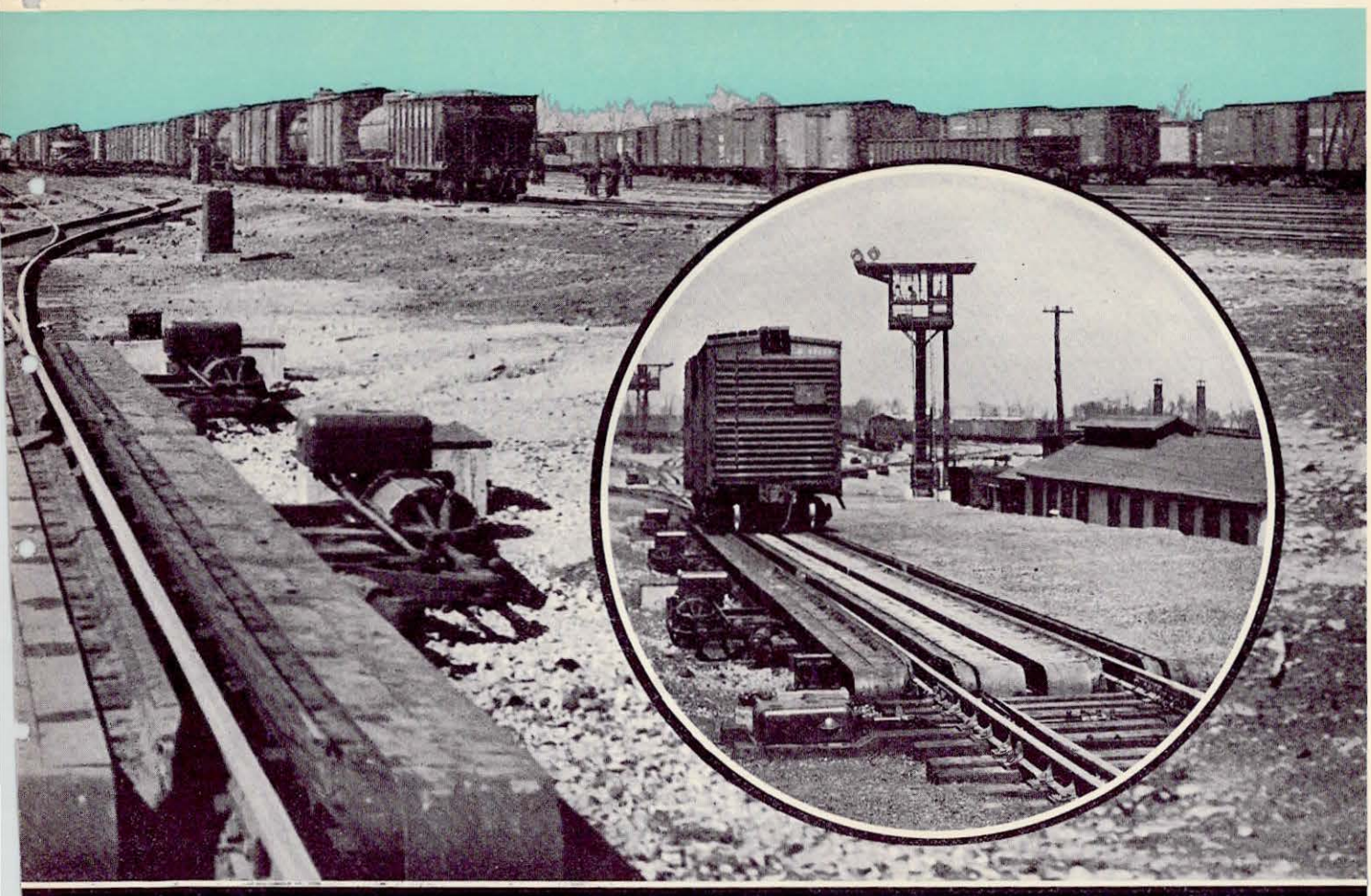


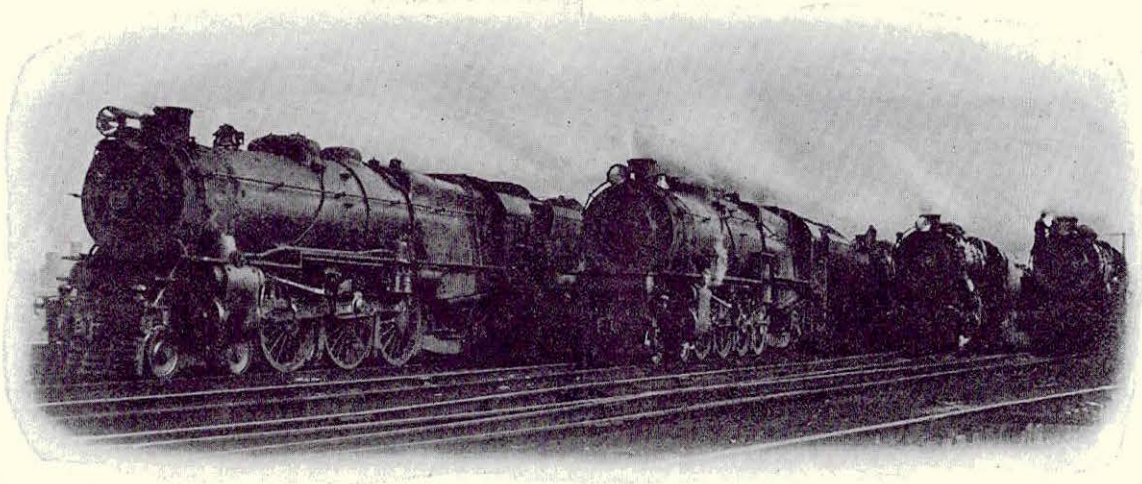
proves Car Retarders are Self-Liquidating

offered, as well as the reduced damage to lading and equipment, are also of real value although not easily expressed in dollars. The "Union" Electro-Pneumatic Car Retarder is a facility that will pay its way under abnormally low traffic conditions and earn a most lucrative return in normal times.

Ask our nearest district office to cooperate in estimating the savings to be effected by a proposed installation. Installations made now will provide those facilities so necessary with a general pick-up in traffic.

Union Switch & Signal Co.
SWISSVALE, PA.

1881 1933



AN INVESTMENT BANKER SPEAKS

"The saving from the use of modern power is amazing. A large eastern railroad which bought ten modern locomotives two years ago estimates that they have already paid for themselves." — ELIOT K. BARTHOLOMEW, before the *American Institute of Banking Section, American Bankers Association.*

The modern locomotive as it stands today offers the greatest single opportunity to reduce railroad operating costs and thereby to increase net operating income.

It takes Modern Locomotives to make money these days!

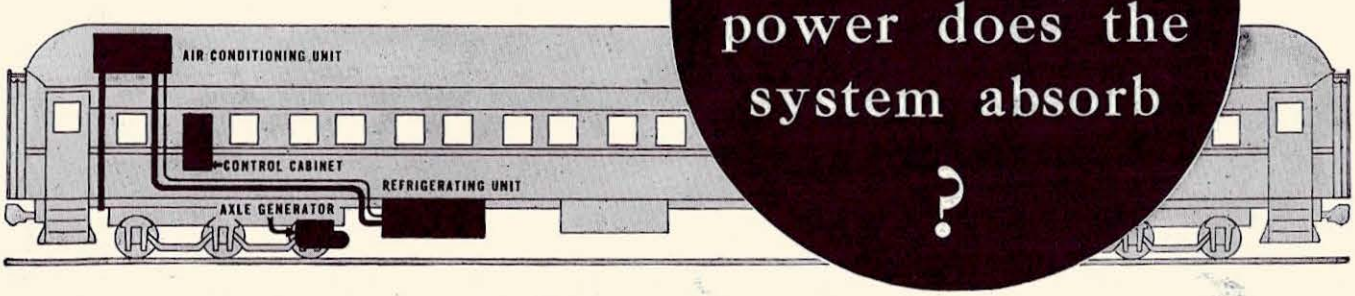
THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA

BEFORE YOU BUY AIR CONDITIONING—

Ask this question

★ How much locomotive power does the system absorb ?



Westinghouse provides complete Air Conditioning Equipment, from rail to roof, that is easy to install.

ON the average the Westinghouse system adds only 3 to 4 per cent to the power required from the locomotive for a completely air conditioned train.

This *simplified* electrical system (using an axle generator to supply power not only for air conditioning but also for lighting) gives you *complete* air conditioning, *yet operates at higher efficiency than systems offering only a partial solution to the problem.*

And what does this mean in operating costs? Operating experience indicates that the addition of one-third to one-half passenger per car per day will pay *all* the costs of operating this system.

★ *One of a series of vital questions which should be asked by railroad officials and engineers before buying air conditioning equipment. A complete set of answers to these questions can be obtained by writing to Westinghouse Electric, Room 2-N, East Pittsburgh, Penna.*

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Quality workmanship guarantees every Westinghouse product

Delays Caused by Fog, Storms and Thick Weather Can Now Be Eliminated so far as Signal Visibility is Concerned

G-R-S Cab Signals Enable Locomotive Engineers to Maintain Schedules Safely Regardless of Weather Conditions

What would have been considered magic a few years ago is now a practical reality. A signal in the locomotive cab, in front of the engineer, gives him, continuously, positive information about track and block conditions so that he can run at normal speed as safely in foul weather as in fair. When track or block conditions change, the cab signal indication changes instantly, preceded by a sharp blast of a whistle, which directs the engineer's attention to the changed indication and enables him to take immediate action.

The G-R-S Cab Signal System is one of the outstanding developments of modern signaling which has demonstrated its economy through better, safer, and faster operation. G-R-S Cab Signals will greatly improve operation on your railway. Our engineering department is at your service.

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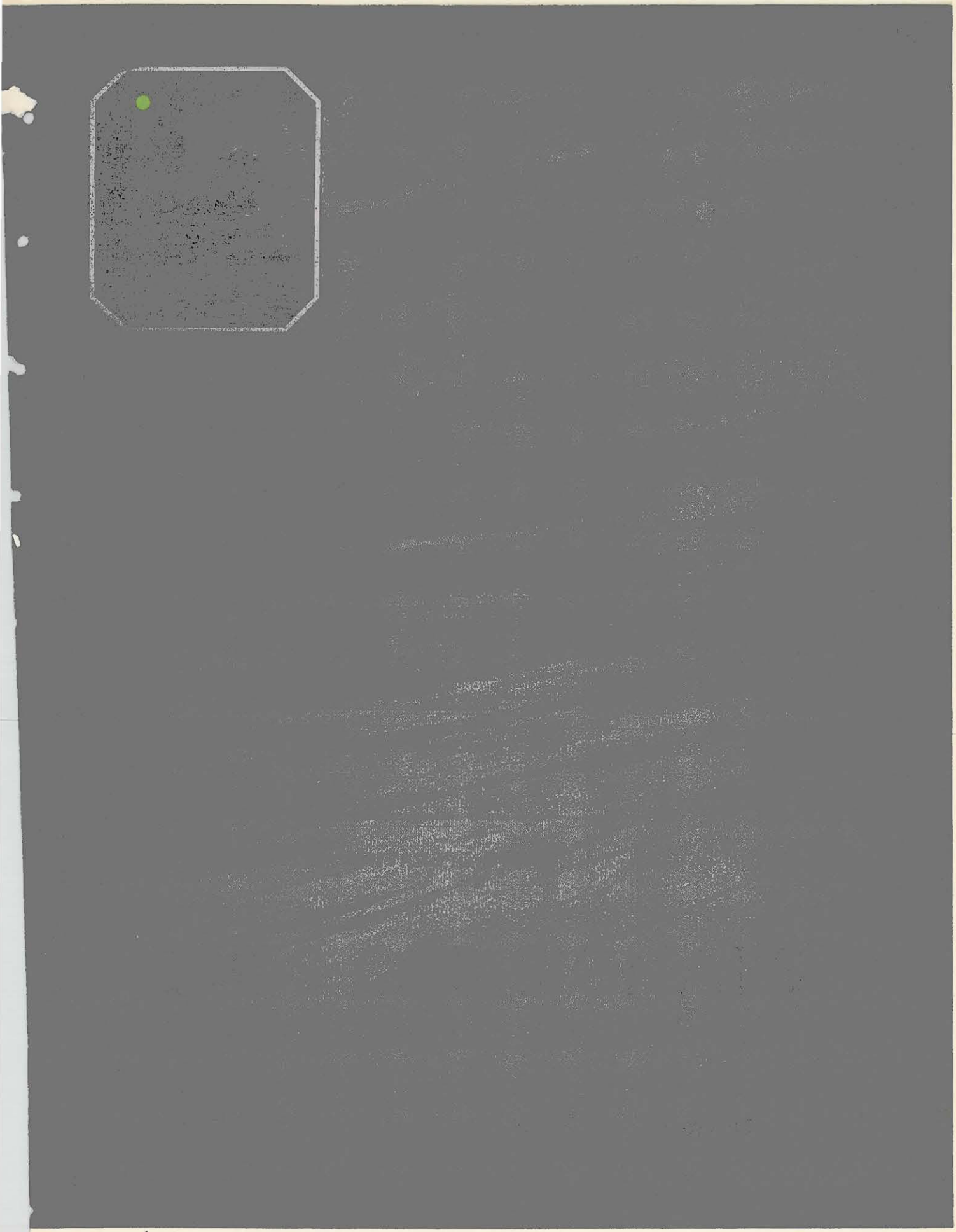

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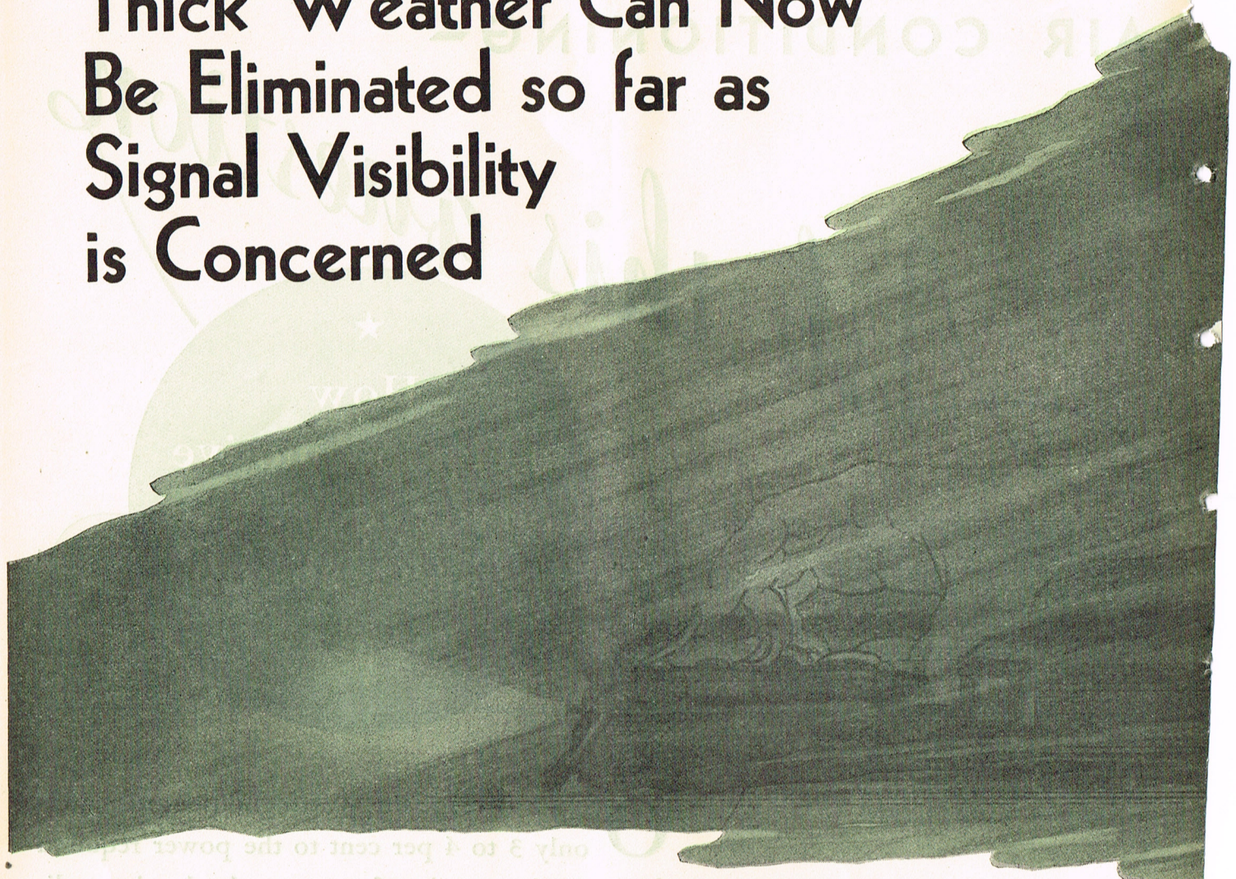

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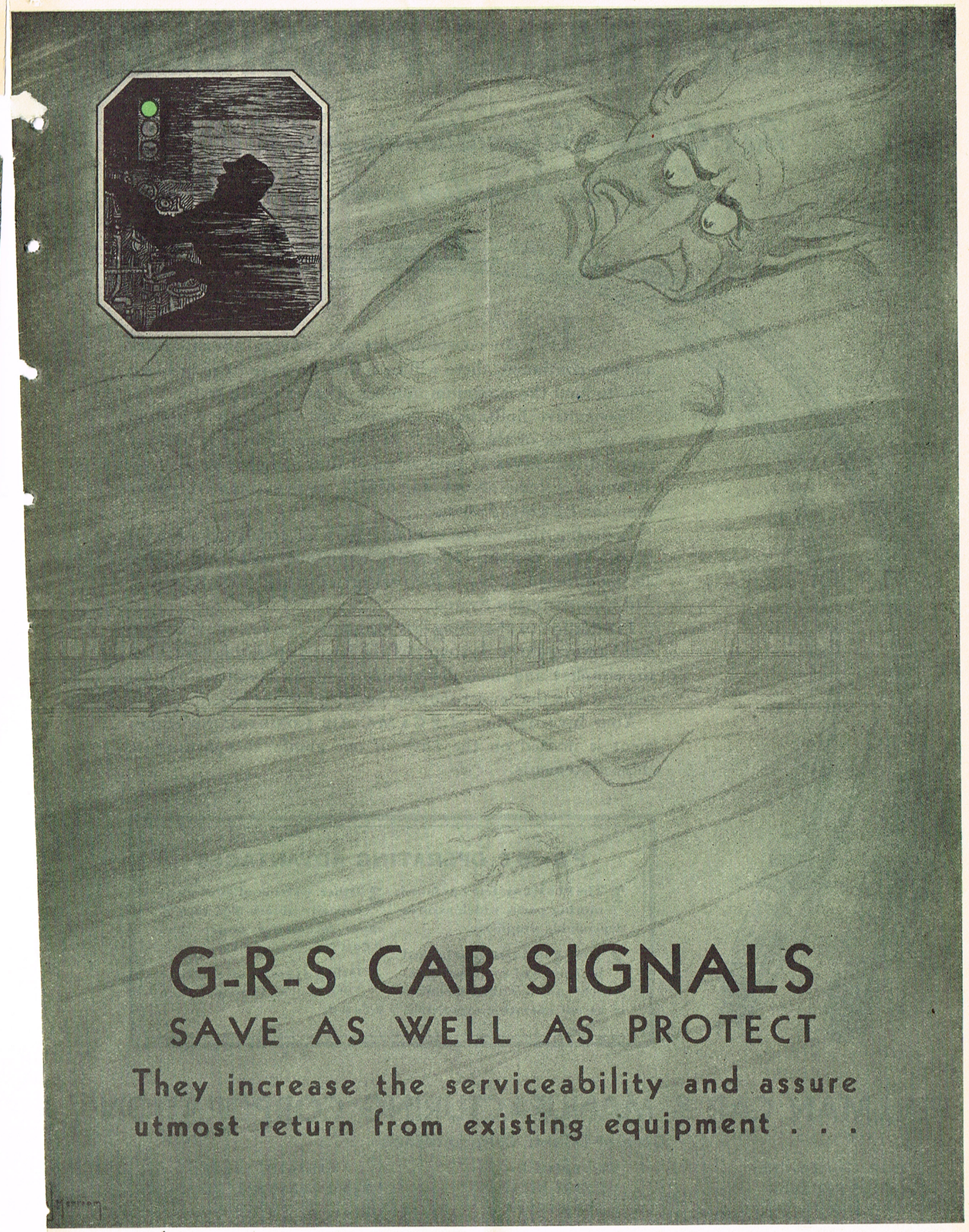


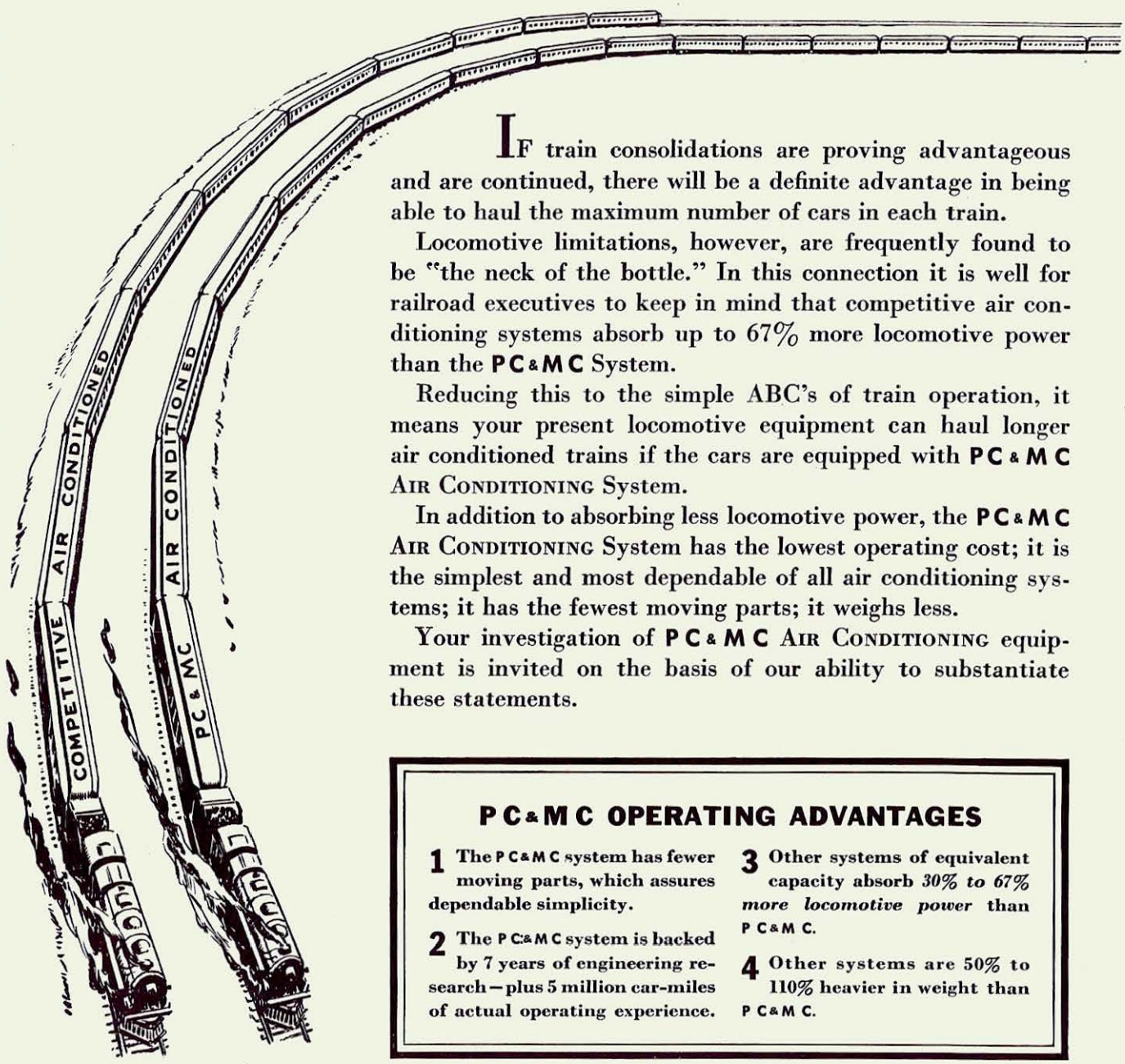
G-R-S CAB SIGNALS

SAVE AS WELL AS PROTECT

They increase the serviceability and assure utmost return from existing equipment . . .

LONGER TRAINS POSSIBLE!

The PC&MC *Air Conditioning System absorbs less locomotive power!*



IF train consolidations are proving advantageous and are continued, there will be a definite advantage in being able to haul the maximum number of cars in each train.

Locomotive limitations, however, are frequently found to be "the neck of the bottle." In this connection it is well for railroad executives to keep in mind that competitive air conditioning systems absorb up to 67% more locomotive power than the **PC&MC** System.

Reducing this to the simple ABC's of train operation, it means your present locomotive equipment can haul longer air conditioned trains if the cars are equipped with **PC&MC** AIR CONDITIONING System.

In addition to absorbing less locomotive power, the **PC&MC** AIR CONDITIONING System has the lowest operating cost; it is the simplest and most dependable of all air conditioning systems; it has the fewest moving parts; it weighs less.

Your investigation of **PC&MC** AIR CONDITIONING equipment is invited on the basis of our ability to substantiate these statements.

PC&MC OPERATING ADVANTAGES

1 The PC&MC system has fewer moving parts, which assures dependable simplicity.

2 The PC&MC system is backed by 7 years of engineering research—plus 5 million car-miles of actual operating experience.

3 Other systems of equivalent capacity absorb *30% to 67% more locomotive power* than PC&MC.

4 Other systems are 50% to 110% heavier in weight than PC&MC.

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KEEP an eye on the performance records of your rolling stock that is equipped with Armco WROUGHT STEEL WHEELS! Your 50-ton freight equipment will roll long and safely on Armco ONE-WEAR WHEELS. For exacting heavy service choose Armco HEAT-TREATED WHEELS and watch performance records reach new heights. Armco Wheels are the result of extreme care in every manufacturing operation, from the selection of raw materials to the final finishing operation. Every heat of wheel steel is uniform, and every wheel is carefully rolled and accurately finished. See us about your requirements when next you need wheels for any purpose.

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THE ARMCO RAILROAD SALES CO. *Executive Offices:* Middletown, Ohio

Subsidiary of The American Rolling Mill Company

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AT FULL SPEED... slow speed...standing still

FRIGIDAIRE DELIVERS COMPLETE AIR COOLING

When you equip your cars for air conditioning, one of the most important considerations is a system that will keep the cars completely cooled at all times—whether the train is moving slowly, at full speed, or standing in stations. Frigidaire is such a system. And an A-C connection makes it possible to pre-cool cars at terminals, using outside power.

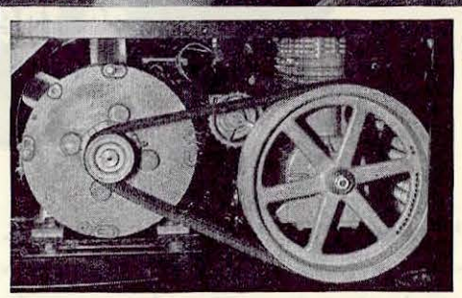
Many other features make Frigidaire the outstanding air conditioning system for railway cars. For example, the bulkhead air delivery system, pioneered and developed by Frigidaire, permits low cost installation in open type cars such as diners, coaches and chair cars. And for cars that are subdivided, making bulkhead air delivery impossible, Frigidaire has equipment for duct installations.

And the extremely light weight of the Frigidaire refrigerating unit is one of its most important advantages. Furthermore, the Frigidaire unit is small in size, permitting installation within the clearance diagrams of all Class 1 Railroads, without expensive alteration of car structures.

Frigidaire air conditioning equipment for railroads was developed by Frigidaire and General Motors engineers, has been thoroughly road-tested, and is in successful operation on many important lines.

Railway Division, Frigidaire Corporation, *Subsidiary of General Motors Corporation*, Dayton, Ohio.

Interior view of Missouri-Pacific Diner equipped with Frigidaire. Note bulkhead air delivery from inconspicuous grilles at both ends of car.



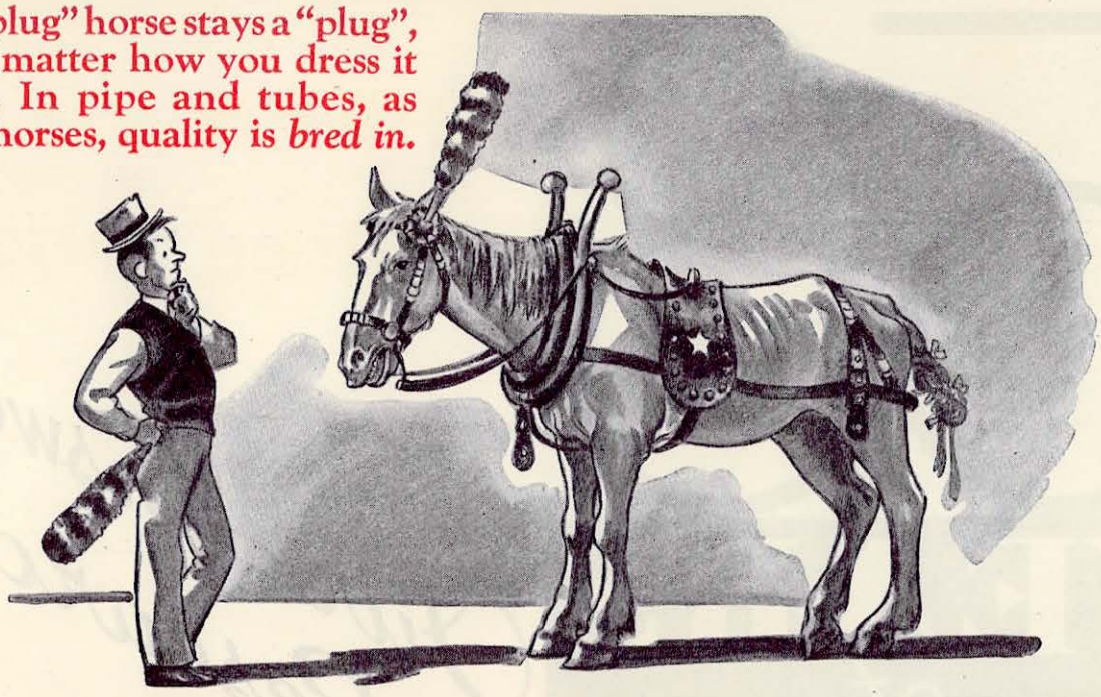
The Frigidaire condensing unit—powerful, but light in weight—easily installed under car frame. Only 84 inches long, 28 inches high and 35 inches wide. Complete refrigerating unit weighs only 2100 lbs.

FRIGIDAIRE

AIR CONDITIONING SYSTEMS

GM FRIGIDAIRE

a "plug" horse stays a "plug", no matter how you dress it up. In pipe and tubes, as in horses, quality is *bred in.*



For THOROUGHBRED Performance—
Pick Thoroughbred Pipe and Tubes!

Generations ago, Reading Puddled Iron Pipe and Reading Charcoal Iron Boiler Tubes PROVED they have the endurance which some other kinds of pipe and tubes are trying to attain today. Imitation "irons" . . . throwing together of various metals . . . have failed to produce pipe and tubes as good as Reading when specific uses demand *thoroughbred* performance.

Reading does not offer a "cure-all" for pipe and tube troubles. But the unique ability of Reading pipe and tubes to resist *a variety* of destructive conditions puts Reading products in a class by themselves where those conditions exist. If you are buying pipe and tubes for the uses shown on this page, you'll SAVE MONEY by insisting on Reading.

For Roundhouse Pipe

When exposed to smoke or other agents of atmospheric corrosion, Reading Puddled Iron Pipe forms a hard, impervious film of iron oxide which effectively prevents destructive pitting and penetration.

For Locomotive Pipe

Safety and freedom from breakdowns demand pipe that resists BOTH corrosion and vibration. Since 1848, Reading Puddled Iron Pipe has defied these conditions as does no other pipe because of its *fibrous* structure, and the hundreds of thousands of protective siliceous filaments uniformly distributed throughout the pure iron.

For Stations and Other Buildings

Reading Puddled Iron Pipe has a *proved record* in hundreds of instances of outlasting the building in which it is installed. That means enduring economy—continuing freedom from repair and replacement costs.

For Boiler Tubes

Reading Charcoal Iron Boiler Tubes overcome costly and frequent replacements because of their unequalled resistance to corrosion and vibration. READING TUBES are easy to install because they are ductile (soft). They are exceptionally free welding and make ideal safe ending material.

READING PUDDLED IRON

SINCE 1848

READING IRON COMPANY PHILADELPHIA

Science and Invention Have Never Found a Satisfactory Substitute for Genuine Puddled Iron

53 YEARS of Progressive Development

Our Answer to Research Critics

WHILE 53 years old in experience and judgment, we are young in open-mindedness and in vigorous service ideas. We feel that our outstanding accomplishment is the—

UNIVERSAL
DRY LADING ROOF

The Greatest Economic Improvement in Car Construction

It provides *one* standard roof that fits *all* roof standards. Its one-size and one-design parts will fit any length or width or design of house car. If used by all railroads, the savings in repairs, in stock parts, in quick repairs, in low maintenance, in added protection to lading would save the railroads millions of dollars annually.

The roads which have cast aside musty precedents and have applied our roofs have cashed in handsomely. On one road the cost of maintenance on 30,000 Dry Lading Roofs was only $4,519.49 for 18 years—less than one cent per roof per year. On other roads this roof has rendered twenty years of continuous service without maintenance.

These records made on all sorts of steel, composite and wood cars are not for you to envy but to equal and improve. And there's just one way. Go Universal.

Hutchins Car Roofing Company

RAILWAY AGE

The "New Deal" In Government and Business

Business in the United States is now emerging from one of the greatest crises, and at the same time is entering another of the greatest crises, in its history. The crisis from which it is emerging has been due to various causes which resulted in an unprecedented decline of production, commerce, employment, wealth and income. The different kind of a crisis that it is entering will be caused by policies of the federal government which are intended ostensibly to promote economic recovery, but are intended also to establish a planned economy which will prevent such excesses and abuses in business as are believed by those formulating and administering the government's economic policies to have caused the present depression.

The Government's Recovery Policy

The success of business in passing through the new crisis that will be created by the government's new policies will depend upon its ability to adjust itself to the parts of those policies that are economically sound, and to exert an effective influence for the correction or elimination of the parts of them that are unsound. There are current a number of misconceptions as to what the policies and objectives, both immediate and ultimate, of the government actually are. This is not surprising, as there is not entire agreement regarding them among high government officials themselves. The writer of this editorial recently has had the advantage of hearing the government's policies and objectives stated by General Hugh Johnson, head of the industrial recovery administration; Secretary of Agriculture Wallace, Colonel Waite, who was recently placed in charge of the public works program; Lewis W. Douglas, director of the budget, and some other men high in the councils of the government. It is eminently desirable that business men should understand what the government is doing, how it is doing it and what it is trying to accomplish. Discussion of its policies which is not based upon such understanding is likely to accomplish little and to do more harm than good.

The government's immediate purpose is to increase employment and the purchasing power of the people as a means to increasing the effective demand for the products of industry and agriculture. The legislation enacted for the rehabilitation of industry, agriculture and transportation is being administered by General Johnson, Secretary of Agriculture Wallace, Col. Waite and the federal co-ordinator of transportation, Joseph B. Eastman. General Johnson repeatedly has stated that the objectives of his work should be attained principally by the establishment of "self-regulation of business." Whatever may be their expectations, government officials in Washington do not hazard predictions regarding how long the recovery legislation recently passed by Congress will, in its present or a modified form, remain in effect. It was enacted ostensibly to deal with an emergency, and, according to its provisions, will remain in effect only a few years. Whether its life will be extended, or it will be replaced by other legislation having similar provisions and purposes, is likely to be determined by public opinion regarding the effects of the existing legislation. It is an old saying, however, that revolutions never go backward; and it is certainly true that for almost fifty years railway legislation has steadily become more comprehensive and restrictive, although whether this would have been the case if the railways had adopted more of the self-regulation which General Johnson now urges upon other industries nobody can say.

The present legislation to promote economic recovery and its administration to date are plainly predicated upon the assumption that in this country there have prevailed under the capitalistic system, especially within recent years, selfish and shortsighted competitive and other practices in industry, transportation,

commerce and finance which have thrown production out of balance, prevented maintenance of a reasonable parity between the purchasing powers of different industries and their employees, increased the incomes of many persons without any relationship to their contribution to the general welfare, and caused general maldistribution of the national income, all of which have prevented the balanced increases in purchasing power necessary to the maintenance of national prosperity. One of the methods being used to correct the faults of the capitalistic system which are deemed to have caused the recent great catastrophe is that of, in effect, requiring all major industries to adopt codes to eliminate unfair competition within themselves, to increase employment by reducing the working hours of labor, and to help increase national purchasing power by fixing minimum wages.

The Attack Upon Unfair Competition

The plans for co-ordinating the railways and establishing and enforcing codes of competition in industry seem to go to the heart of the entire matter, because unfair competition is the prolific parent of so many abuses in business. There is hardly a business man in the country who has not charged and complained of it. But what is unfair competition? The government's new policy is calling upon men in every industry definitely to answer that question, first among themselves, and second to government officials, and they are not finding it, nor are they going to find it, an easy question to answer.

As there is competition between different industries as well as within every industry, there can be, and is, unfair competition between different industries as well as within industries.

There is actually only one measure of the fairness of any act or practice in business, and that is the public interest. It is to the public interest that there shall be the largest and best balanced production of commodities that is consistent with reasonable working hours and conditions of employment for all classes of the people, and to the securing and maintenance of a well balanced maximum production it is essential that the national income shall be so distributed as to provide the maximum practicable national purchasing power. The application of the standard of public welfare automatically and immediately condemns many practices, competitive and otherwise, that have prevailed in every industry in the country. If we were discussing government as well as business it would have to be added that the application of the standard of public welfare would also automatically and immediately, and much more severely, condemn many policies and practices that have prevailed, and still prevail, in government; but that is another story.

Rules in Sports and in Business

When we compare the ways in which games of sport and the game of business are played, we perceive at once a very great contrast. Every competitive sport, from tiddle-dy-winks to pugilism, is regulated by rules the purpose of which is to make success dependent entirely upon the skill of the players, and any disregard of these rules causes a man to be disqualified as a player and ostracised as an undesirable member of society. The game of business is the greatest of all games, and every right thinking man has views as to the rules according to which it should be played; but getting money has been allowed to become so paramount a consideration that men who get a large amount of it usually are credited with ability and "success" in playing the game of business, although they may have got the money by violating every principle of honor and decency. If the government's policy of requiring the various industries to adopt and adhere to codes of fair competition should result in causing all business to be conducted in accordance with rules that would give opportunity in business in proportion to ability and honor, it would confer the greatest possible boon upon most business men as well as upon the general public.

There is no difficulty, unfortunately, in citing plenty of practices, competitive and otherwise, that have prevailed in both the railroad industry and the railway equipment and supply manufacturing industry which are automatically condemned by application of the standard of public interest. Any practice in the railroad industry which gives one railroad an advantage over others that is not due to more efficient operation or salesmanship, which needlessly curtails needed railway revenues, which makes operating expenses of the railway industry higher than is necessary to render good and adequate service, or which operates to discriminate unfairly between the patrons of the railways or those who sell them equipment or materials, is obviously contrary to the public interest. Presumably all such practices in the railroad industry will be dealt with by the federal co-ordinator of transportation and the regional committees of railway executives which have been created under the co-ordinating legislation.

"Reciprocal Buying" as Unfair Competition

Among the forms of unfair competition which have affected both the railways and the railway equipment and supply manufacturing industry is that of "reciprocal buying"—the use of traffic to influence railway purchases, and of railway purchases to influence traffic. This practice and its effects repeatedly have been described and discussed in the *Railway Age*. It has been investigated by both the Interstate Commerce Commission and the Federal Trade Commission, and in two cases the Federal Trade Commission has definitely held that the use of the traffic of large shippers to influence railways to make purchases from certain companies is unfair competition. The Industrial Recovery Act affords the railway equipment and supply manufacturing industry an opportunity to present to the government for its approval and enforcement a code

of competition which will eliminate this and other unfair practices of which there has been much complaint in that industry, and it is to be hoped that advantage will be taken of the opportunity.

As has been already pointed out, there is not only unfair competition within industries, but between industries, and there are no industries which are at present subject to more unfair competition from other industries than are the railroad and the railway equipment and supply manufacturing industries. This unfair competition has been created principally by those policies of the state and national governments which have subsidized highway and water transportation without regulating them, while strictly regulating railway transportation without subsidizing it. They have diverted large amounts of business from the railroads and the railway equipment and supply manufacturing industry in disregard of every principle of economics and fairness. If the government is entirely sincere in its determination to eliminate unfair competition, which we do not question, it must be plain to its officials who are charged with carrying out its economic recovery program that it has no more obvious duty than that of equalizing the conditions of competition between the railways, on the one hand, and of other means of transportation, on the other hand, as much as they can be equalized by the application to them of comparable government policies.

Will Capitalistic System Be Improved—or Destroyed?

For years there has been a general demand from business for less government in business. Many of those who have voiced the demand have not been sincere because, while voicing it, they have been asking for government favoritism for themselves in such matters as the fixing of tariffs, taxation, the expenditure of public money and the regulation of industry. Instead of less government in business, we are now going to have more government in business than ever before. Instead of a balanced federal budget, we will have, during the next year, probably the most unbalanced federal budget in history, and corresponding effects upon taxation, because of the large expenditures to be made upon public works and the government loans to be made, directly and indirectly, to various industries and many individuals. Instead of reducing government regulation of some kinds of business, we are going to have more kinds of regulation of more kinds of business than ever were known. The purpose of it all is to increase employment and national purchasing power, and thus revive business, although in past depressions it always has been the revival of business which has increased employment and national purchasing power. We are embarking upon an experiment in economics unprecedented in all history in both its methods and its magnitude.

As the government has ample power to make the experiment and is going to make it whether business men like it or not, the only reasonable thing for business men to do in the early future is to give the government officials in charge of it their full co-operation by helping them to carry out those policies that business men believe to be sound, or required by law regardless of their soundness, and by opposing those policies they believe to be unsound and not required by law. What the final effects will be upon the capitalistic system in the United States no one is wise enough to foresee. It may be improved, or it may be destroyed, but that the methods used in the conduct of production, transportation, commerce and finance, and the distribution of the income derived from them, will long be greatly changed now seems highly probable.

Modern Spring Switches

Although electric railways have used spring switches successfully for years, the early experience of the steam railroads was not satisfactory. The "slapping" of the points between the passing of car trucks in long trains was objectionable for several reasons. These objections were overcome by the development of the oil-buffer some ten years ago, and a considerable number of roads have since installed spring switches quite extensively. In these installations signals are used to check the position of the points for approaching trains but there still remained the possibility of the points being forced open under a train. To reduce this hazard, speed restrictions have been established, especially for facing-point train movements, which restrictions not only introduce some delay but are in some cases a handicap on ascending grades.

Within the last two years this last-mentioned objection to spring switches has been eliminated by the development of facing-point locks of at least two different types, by means of which the spring switch can be locked in the same manner as any interlocked switch. These new locks make it practicable and safe to employ spring switches more extensively. At Duff, Pa., for example, the Pennsylvania had closed an interlocking as a measure of economy and as a result long heavy freight trains experienced difficulty in pulling out of this yard. The installation of a spring switch with a facing-point lock permitted these trains to pull out and ascend a grade without stopping to close the switch. Another large road recently installed one of these spring switches at an end of double track and thus made possible the elimination of an interlocking. The use of spring switches is, of course, limited to certain track layouts and conditions of train operation, but it would seem that consideration can now be given to their use where they have previously been considered unsafe, since the facing-point lock seems to answer the safety requirement.

Will Air Conditioning Attract More Passengers?

Railroads which have tried it say, "Yes"— Year-round value as traffic developer

ON a recent Saturday, a passenger train of one railroad carried 480 through passengers from the East to the Middle West. The train of another railroad, operating between the same points on a schedule equally fast and with almost the same hours of arrival and departure, carried less than 100 passengers. Why did one train operate in several well-filled sections while the other attracted only a fraction of the business handled by its direct competitor? The only apparent reason, since all other considerations were virtually identical, was that the first train was air-conditioned from the club car at the front to the observation car at the rear, while the second train was not.

So far as the railroads of the United States are concerned, the summer of 1933 marked the fourth anniversary of the introduction of air-conditioned passenger train equipment. Four years ago, the Baltimore & Ohio equipped one of its day coaches for complete summer air conditioning. Today, nearly a score of leading railways have one or more of their through trains partially or completely air-conditioned. In most cases, the air conditioning of equipment has been confined thus far to dining cars and lounge cars, but in several cases complete trains, with all passenger equipment fully air-conditioned, are in service, introducing the traveling public to a new high standard of travel comfort.

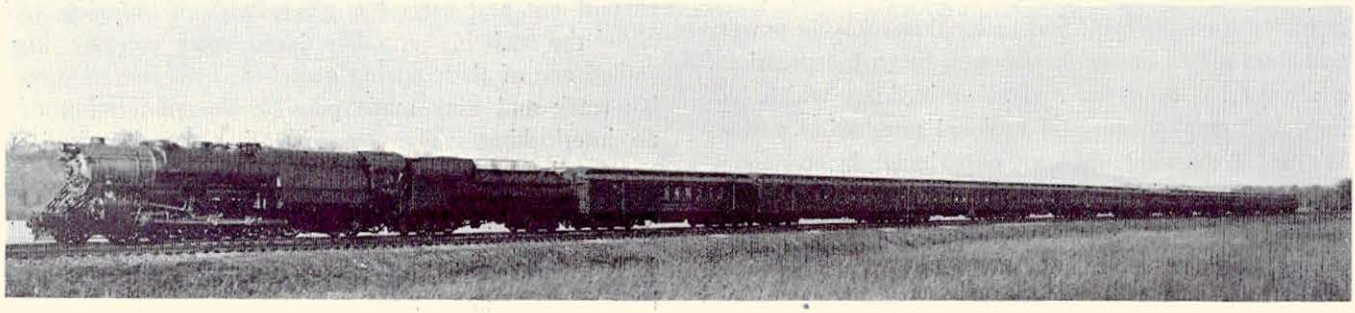
Definite Trend toward Air Conditioning

With air-conditioned dining cars in service on leading trains of the Atchison, Topeka & Santa Fe; the Chicago, Burlington & Quincy; the Chicago, Milwaukee, St. Paul & Pacific; the Chicago, Rock Island & Pacific; the New York Central; the Southern Pacific and the Union Pacific; with air-conditioned dining cars and lounge cars on the Missouri-Kansas-Texas, the Missouri Pacific, the St. Louis-San Francisco and the Texas & Pacific; with fully air-conditioned trains on the Alton, the Baltimore & Ohio, the Chicago & Eastern Illinois, the Illinois Central and the Wabash; with all through trains completely air-conditioned on the Chesapeake & Ohio; and with the Pennsylvania operating air-conditioned coaches, dining cars and parlor cars between New York and Washington and hastening the completion of air conditioning of such cars on its trains between New York and Philadelphia, Pa., there can be no doubt of the trend on the American railroads in the direction of full air conditioning of all first-class passenger trains.

To the passenger, air conditioning of the train on which he rides means a clean trip free from dust and cinders, a quiet trip in a car insulated against external noise, and a trip in a temperature which is comfortable from the standpoint of both temperature and humidity. From the standpoint of the passenger traffic solicitor, it means a new talking point in favor of railroad transportation, as compared to competitive forms of transportation which do not offer this feature. But what does air conditioning mean from the standpoint of the railways and passenger revenue in general? Will the air conditioning of the through passenger trains of the United States assist the railways measurably in their efforts to recoup the heavy losses in passenger traffic which they have suffered during the past decade? In short, will the investment in air-conditioning equipment "pay out"?

Additional Traffic Attracted

Unfortunately, specific statistics representing the extent of traffic increases on air-conditioned trains are not available for publication, and even if they were, they might mean either more or less than their surface indications on account of other influential factors. However, this much can be said: The complete air conditioning of passenger trains and even the air conditioning only of dining or lounge cars has attracted to the trains in question traffic which they would not otherwise have carried. Even last year, when passenger traffic was in a steady decline, the complete air conditioning of a train on a run of substantial length brought about an increase

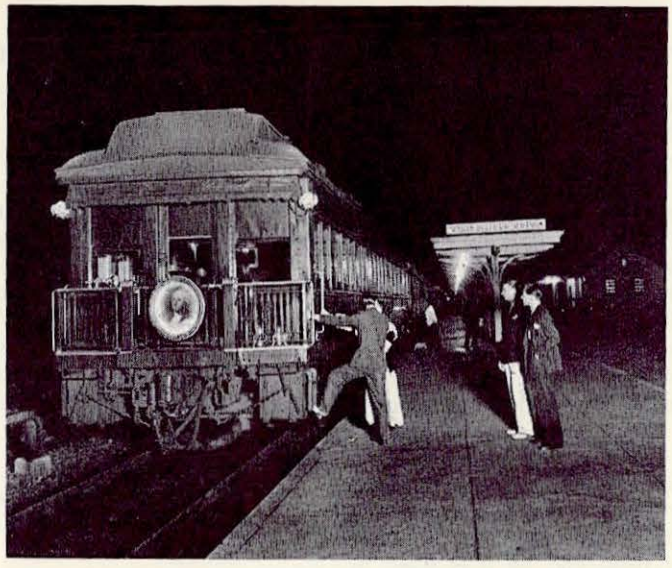


The "Capitol Limited" of the Baltimore & Ohio Was the First Long-Distance Train to Be Fully Air-Conditioned

in traffic of from 18 to 20 per cent in the first month of its operation.

The Baltimore & Ohio, for example, has accomplished excellent results by the air conditioning of three of its principal trains. The B. & O. is the pioneer in the air conditioning of both individual cars and full trains, and at the present time, in addition to the three completely equipped trains, has about 40 dining cars and a number of parlor cars, lounge cars and coaches with air-conditioned equipment. The first through train completely air-conditioned was the "Columbian," an afternoon train in each direction between New York, Philadelphia, Baltimore, Md., and Washington. This train carries coaches, lounge cars, dining cars, parlor cars and an observation car.

In April, 1932, the "Capitol Limited" between New York, Washington and Chicago was fully equipped, as was also the "National Limited" between New York, Washington, Cincinnati, Ohio, Louisville, Ky., and St. Louis, Mo. The new service has been widely advertised in magazines and newspapers. While no statistics are available as to the exact amount of the increase in passenger revenue on the Baltimore & Ohio's air-conditioned trains, it is significant that one of the most pressing problems which the traffic department is attempting to solve this summer is that of getting enough air-conditioned cars to meet the demand. The air-conditioned "Capitol Limited" this summer is frequently operating in several sections, and difficulties have arisen, not in getting enough passengers to fill the train, but in getting enough air-conditioned cars to accommodate the traffic on hand.



"The George Washington," Leader of the Chesapeake & Ohio's Fleet of Completely Air-Conditioned Trains

What the C. & O. Has Accomplished

The Chesapeake & Ohio affords an even better example of what air conditioning can do. This railroad owes, largely to air conditioning, its return to prominence as a passenger carrier. The C. & O. attracted much attention last year when it placed "The George Washington," an entirely new and completely air-conditioned train, in service between Washington and Cincinnati, with through cars to New York, Chicago, St. Louis and Louisville. This spring, the Chesapeake & Ohio again made news when it announced and carried out its plan to completely air condition all its through trains, including the "F. F. V." and "The Sportsman." Extensive advertising in national magazines and in newspapers has fully publicized the attractions of the trains.

During the first 12 months in which "The George Washington" was operated as a completely air-conditioned train, its revenues were approximately 25 per cent greater than in the preceding 12 months during which it was not air-conditioned. This increase in traffic, furthermore, came at a time when the revenue of other trains was showing a decrease of from 25 to 30 per cent. Practically all of the additional business handled on this train was new to the Chesapeake & Ohio, and a check made among the passengers carried on all the air-conditioned trains showed that a great many of the passengers were either people who had never ridden on the Chesapeake & Ohio or people who had not ridden on it for 15 or 20 years—since it went into eclipse as a passenger carrier during the war.

Sources of Additional Traffic

What is the source of the additional traffic being attracted to partially or completely air-conditioned trains? Obviously, a substantial proportion of it is business taken away from non-air-conditioned trains of the same or other railroads. In addition, however, there is evidence that air conditioning of passenger trains is creating new railroad business. Probably little of the increased traffic is business recovered from motor buses, because the low rates offered are considered the determining factor in the popularity of bus travel; but a certain amount of business, in the opinion of traffic officers, has been won back from air transportation and from the private automobile. The recovery of business from the private automobile has been especially noted on the Chesapeake & Ohio, the trains of which serve White Sulphur Springs, Va., and Hot Springs. Numbers of people going to these resorts this year have ridden in the air-conditioned trains instead of in their own cars, letting their chauffeurs bring their automobiles along after them. Numbers of commercial travelers, likewise, have abandoned automobile transportation in favor of travel on the C. & O.'s air-conditioned trains. There is some evidence as to the traffic developing qualities of partially air-conditioned trains, as compared to completely air-conditioned trains. Although the railroads with only lounge or dining cars air-conditioned report no complaints from passengers that the other cars are not fully equipped, it is significant that the principal increases in business attributable to air conditioning are on the trains completely equipped. The Missouri-Kansas-Texas, which operates air-conditioned dining cars and lounge cars on its "Texas Special" has been subjected to no criticism

In the Issue of August 5

Will further replacement of old-fashioned day coaches by modern, comfortable equipment help to restore to the railways the heavy coach traffic which they once enjoyed? By installing new and more restful furnishings in up-to-date, easy riding cars, can the railways make a stronger bid for the patronage of travellers now going by automobile and motor bus? Modernized passenger equipment and its effectiveness in attracting more traffic to the trains will be the subject of the next article in the Traffic Development Series, to appear in the *Railway Age* of August 5.

for not air conditioning the entire train. The belief is expressed by the traffic department of this road that the public is grateful for the partial air conditioning and appreciates that the whole scheme is in a formative state.

The Chesapeake & Ohio, however, finds that the attitude of passengers toward air conditioning in only one or two cars, as compared to full air conditioning, is less favorable. It notes that there is a tendency on the part of the passengers to crowd the air-conditioned cars, excluding some passengers from them. Also, the reaction in passing from an air-conditioned car to one that is not air-conditioned is disagreeable. The consensus of traffic officers is that air conditioning of dining and lounge cars is good, but that air conditioning of the entire train is better and more effective in developing additional traffic.

Air Conditioning or Air Cooling?

Another aspect of the air conditioning question which is receiving much discussion at this time is as to the real meaning of "air conditioning." The term "air conditioning," as it is popularly used and as it is used in this article, may mean anything from genuine air conditioning, which is an all-year operation, to the simple cooling of the air during the summer months. With "air cooling," the fresh air intake operates only during the summer time; with "air conditioning," the fresh air intake operates throughout the year, the air being cooled or heated and humidified or dehumidified, as needed. Up to now, the cooling feature is the one which has attracted the greatest amount of public attention, and the most marked traffic stimulus has been felt in the summer months. It is the feeling of roads which have applied genuine air-conditioning equipment, however, that the extra comfort of travel in air-conditioned trains during the cooler months, with its attendant cleanliness and proper humidification of the air, will ultimately be valued as highly by the traveling public as it is during the warmer months of the year. The railways which have accomplished the most in the development of additional passenger traffic by the air conditioning of trains are those which have adopted air conditioning rather than air cooling.

The passenger traffic officers of railways which have air conditioned their passenger equipment are warm in their praise of this contributor to travel comfort. Its cost is low, the Illinois Central having found that the operating expense and fixed charges of the air-conditioning equipment of its Chicago-St. Louis train are defrayed by one-half additional passenger per car per day. With the railways the only form of transportation offering this feature, traffic officers look upon air conditioning as one of the trump cards available to the railways in their contest for traffic with competitive forms of transportation. Air conditioning is winning the gratitude of passengers and earning their praise for the enterprise of the railways in offering it. That air conditioning of passenger equipment will attract more passengers has been definitely established to the satisfaction of the railroads which have tried it, as evidenced by the fact that the pioneers, which began with the air conditioning of a few cars, have adopted it for more cars and for full trains.

THE SEABOARD AIR LINE will henceforth allow passengers who ride on passes or half-rate permits to take advantage of reduced round-trip rates made by the Pullman company for excursions. With numerous excursions the Pullman round-trip rate is 1½ times the one-way rate. The pass-holders must conform to the time limits and other conditions. Holders of half-rate permits issued by the Pullman company will have no part in this allowance, as they already pay only half price each way.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended July 8, which included a holiday, amounted to 539,223 cars, a reduction of 94,851 cars as compared with the preceding week, but an increase of 123,295 cars, or 29 per cent above the total for the corresponding week of last year. As compared with the corresponding week of 1931, which did not include a holiday, it was a decrease of 223,221 cars. All commodity classifications showed increases as compared with last year but all showed decreases as compared with the week before the holiday. The summary, as compiled by the Car Service Division of the American Railway Association, is as follows:

Revenue Freight Car Loading

Week Ended Saturday, July 8, 1933

Districts	1933	1932	1931
Eastern	118,400	91,670	162,051
Allegheny	110,245	79,330	148,554
Pocahontas	39,245	26,561	45,821
Southern	78,782	60,311	103,167
Northwestern	70,858	50,775	106,177
Central Western	76,935	71,349	127,264
Southwestern	44,758	35,932	69,410
Total Western Districts	192,551	158,056	302,851
Total All Roads	539,223	415,928	762,444
Commodities			
Grain and Grain Products	44,940	30,293	60,372
Live Stock	13,483	12,928	18,000
Coal	90,382	59,995	109,891
Coke	6,250	2,460	5,080
Forest Products	21,440	11,372	26,174
Ore	16,358	5,440	36,288
Mdse. L. C. L.	146,331	143,170	216,819
Miscellaneous	200,039	150,270	289,820
July 8	539,223	415,928	762,444
July 1	634,074	488,281	667,630
June 24	604,668	498,993	759,363
June 17	587,931	518,398	739,094
June 10	564,546	501,685	732,409
Cumulative total, 27 weeks	13,780,941	14,523,748	19,782,929

Car Loading in Canada

Car loadings in Canada for the week ended July 8 increased from 35,289 cars for the previous week to 40,469 cars, but after adjustment for the holiday and seasonal variations the index number declined a fraction of a point, from 64.96 to 64.18.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
July 8, 1933	40,469	19,368
July 1, 1933	35,289	20,673
June 24, 1933	39,827	19,688
July 9, 1932	39,053	13,921
Cumulative Totals for Canada:		
July 8, 1933	941,334	479,700
July 9, 1932	1,115,899	542,785
July 4, 1931	1,302,589	738,077

AIR-EXPRESS BUSINESS over the 12,500-mi. air-transport lines system of the Railway Express Agency, Inc., increased by 204 per cent in shipment units in June over the same month of last year and by 7.5 per cent over May, 1933, according to a recent announcement of J. H. Butler, general manager, Department of Public Relations. The record of the System's air-express business for the three months, June, May and April of this year showed steady increases over the same periods of 1932, as likewise over the preceding quarter of this year.

Aluminum's Tenth Anniversary On The Railroads

A review of the applications of aluminum in the steam and electric railway field with data showing extent of weight reductions

By A. H. Woollen

Aluminum Company of America, New Kensington, Pa.

ONE billion, three hundred million ton-miles, when interpreted in terms of passenger-miles, represents slightly more than one-half of the passenger traffic on American railroads during the year 1928. It also represents the number of ton-miles aluminum has saved the railroads of the United States during its 10 years of service. But whether the 1,300,000,000 ton-miles be considered as payload or non-productive load, the cost of haulage remains the same, and various transportation engineers have conservatively estimated that the cost of fuel alone to transport this amount of weight is in the neighborhood of $3,000,000. To this figure must, of course, be added the saving in maintenance of equipment, permanent way and structures, which the elimination of the 1,300,000,000 ton-miles of dead weight has made possible.

To accomplish this worth-while saving in operating cost, between 14,000,000 and 15,000,000 lb. of aluminum has been employed in 927 railway locomotives and cars and 1,261 electric street cars, 800 of which are of the multiple unit rapid-transit type. Detailed data on the steam railway equipment are contained in the table.

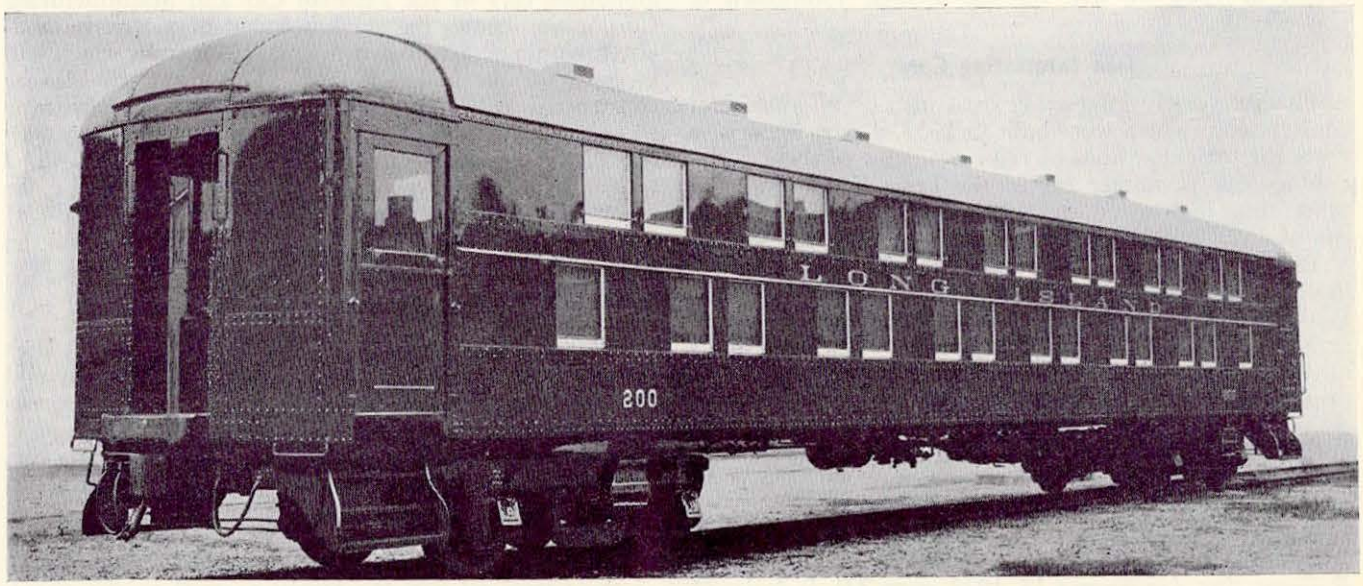
The first significant application took place in the summer of 1923 when the Illinois Central put 25 suburban cars in service on which aluminum was used for the doors, conduit and fittings and all sheet in the superstructure except the outside side sheet. These cars were of the trailer type, destined to be used later in electrified suburban service. In 1926, with the electrification of the railroad well under way, 85 additional trailer units and 130 motor cars were placed in operation. Two years later, 10 motor cars and 10 trailers were built.

The Pennsylvania in 1926, carried the aluminization of suburban cars even farther than did the Illinois Central by building eight multiple-unit motor cars in which the entire superstructure was fabricated of aluminum. A year later, the Chicago & North Western placed in service 120 cars with all sheet in the superstructure of aluminum, the first application of the metal in which the steam locomotive supplied the motive power. During this same period, Aluminum Company of America was experimenting with aluminum side rods on several Alton & Southern locomotives.

Nineteen twenty-eight and 1929 found additional cars aluminized, while 1930 marked the first large quantity use of aluminum on the railroad. The development stage was passing and the commercial era of aluminum rolling stock construction dawning. In this year, the Pennsylvania completed at its Altoona shops the first of the 100 electric locomotives for use on its electrified service between New York and Washington. In designing these locomotives certain limits of weights on drivers had been established, and in order to comply with these limits aluminum parts in various details were used.

Tank and Hopper Cars

Up until 1929, the use of aluminum in railroad rolling stock had been confined to passenger cars or to applica-



Long Island Double Deck Suburban Car with Aluminum Alloy Body and Underframe

tions of an experimental nature on steam locomotives. That year, however, witnessed the use of the metal in the construction of the tanks of tank cars for the transportation of some of the chemicals and food products which were contaminated by the materials commonly employed in tank-car construction. Naturally, this made possible the shipment in bulk form of a number of commodities which had previously been shipped in smaller sized containers. Acetic acid, hydrogen peroxide, formaldehyde, vinegar and turpentine are but a few of the more common examples.

In the case of the tank cars, of which 53 have been built to date, the chemical characteristics of aluminum influenced its use, although its application eliminated more than four tons dead weight from each 8000-gal. car. The chemical properties of aluminum were again called into play in 1931, when the Alcoa Ore Company built ten 70-ton hopper cars with bodies and underframes constructed of strong aluminum alloy shapes and plate. These 10 cars were designed to haul bauxite, the ore of aluminum, sulphur and soft coal. Sulphur and soft coal are particularly harmful to the materials commonly employed in hopper-car construction, while theoretically they have no effect upon aluminum. The service record of these 10 cars, as well as that of the one 50-ton hopper car built by the Pennsylvania Railroad in 1932, has to date confirmed in practice this laboratory conclusion.

Reverting again to passenger-car construction, the first all-aluminum car body, that is, body and underframe, was developed for the Indiana Railroad System in 1931. The 35 cars built for this railroad were followed in 1932 by five for the Fonda, Johnstown & Gloversville.

Two Interesting Cars

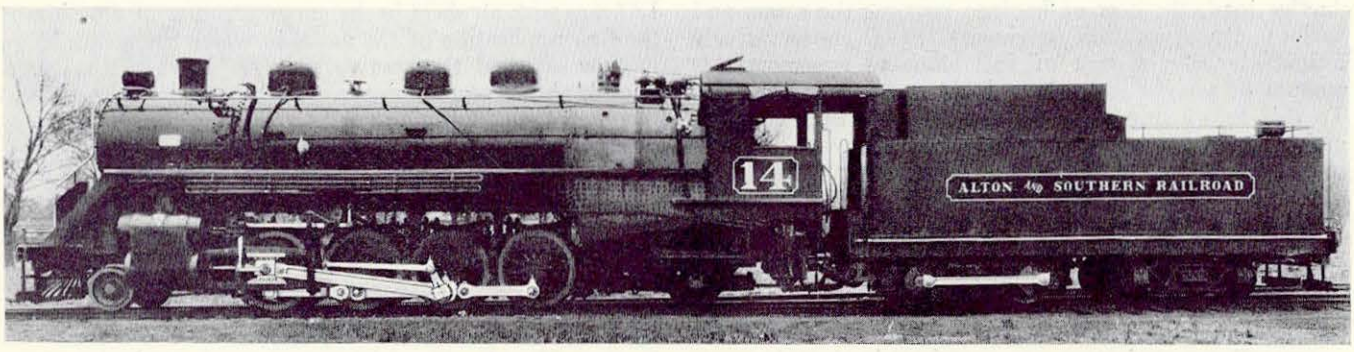
Two extremely interesting cars, also of all-aluminum construction, which were built in 1932, depart materially from the orthodox lines of rail cars. One of these is the double-deck passenger car of the Long Island, and the other, the high-speed, mechanical-drive, main-line rail car of the Clark Equipment Company.

The Pennsylvania, which operates the Long Island, desired to increase the seating capacity on the Long Island trains operating from the Pennsylvania terminal in New York. To increase the number of cars per train or the length of the individual cars would, of course, present additional traffic problems. To observe the reactions of the travelling public and as an initial experiment, the Pennsylvania built at its Altoona shops a double-deck car capable of seating 120 passengers or 42 more than the normal suburban car used in the Long Island service.

Briefly, the car, which was described in detail in *Railway Age*, for August 13, 1932, page 221, is designed in accordance with the Pennsylvania's standard practice for passenger cars, a stiff center sill being the backbone with two cantilevers to the side framing and no bolsters at the truck centers. Approximately 25,000 lb. of aluminum was employed in the construction of the car body and underframe. The trucks are standard Pennsylvania steel trucks. The actual scale weight of the car is 71,800 lb., and the designers of the car have estimated that a similar car fabricated from the heavier materials would weigh approximately 110,900 lb.

The Autotram, or rail car of the Clark Equipment Company, which has also been described in *Railway Age* for April 15, 1933, page 544, is built almost entirely of light strong aluminum alloys. Seating 42 passengers and capable of operating at fast schedule speeds over standard roadbeds, it embodies many new and radical changes in design. The fully streamlined car is approximately 60 ft. long, light enough for economical operation but strong enough to meet the requirements of main-line service. The car, when it is fully loaded, weighs but 32,000 lb.

The attention of the railroad industry has recently been called to two all-aluminum cars built by the Pullman Car and Manufacturing Corporation. One of these is a de luxe type combination passenger coach, parlor observation, and the other, a combination sleeping car, parlor observation. These cars are the first all-aluminum cars to be built, as both the bodies and trucks, with the exception of the wheels, axles, springs and certain wearing parts, are fabricated entirely of aluminum.



Alton & Southern Locomotive with Forged Aluminum Driving Rods, Cast Aluminum Crossheads and Cab and Boiler Jacket of Aluminum

Following closely after the completion of the two all-aluminum cars by the Pullman Car and Manufacturing Corporation comes the announcement of a strictly modern streamlined articulated motor-driven train which will be built for the Union Pacific. This train will also be constructed entirely of aluminum. It will consist of three cars, the first of which will be powered by a 600-hp. distillate-burning internal-combustion motor. The transmission of power to the axles will, of course, be accomplished by a standard electric drive. Because of its articulated construction, only four trucks will be employed for the entire train.

Street Railway Applications

The use of aluminum in electric street cars dates back to 1926 when the Cleveland Railway Company and the Springfield Street Railway Company built experimental aluminum cars. A year later, the Chicago & Joliet Railway Company also built an aluminum car. In contrast to the piece-meal development of the applications for aluminum on railroad cars, these three operating companies employed aluminum wherever they felt the metal was an engineering possibility. In the case of the Cleveland car, the trucks as well as the superstructure and underframe were constructed of aluminum,

Statistical Record of the Use of Aluminum in Railway Equipment

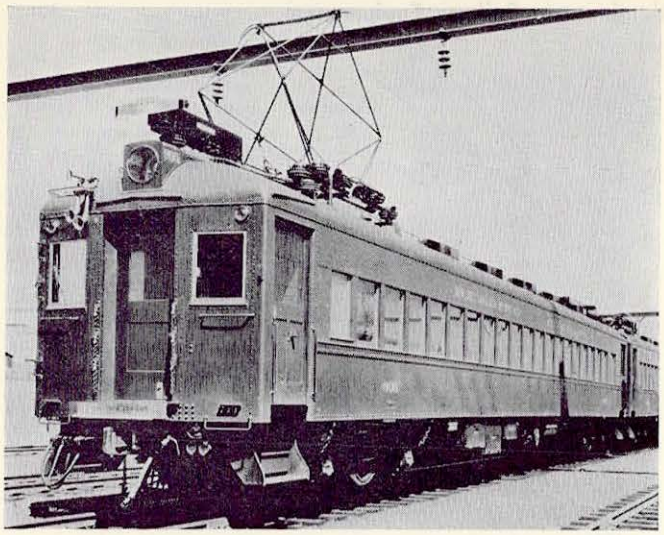
	Operator	Builder	Type	Date built	No.	Weight of trucks, lb.	Total weight of car, lb.			
							Steel or composite[1]	With aluminum	Saved	Per cent
1	Ill. Cen.	Pullman	Trailer	1923	25	26,500	92,200	87,500	4,700	5.1
2	Ill. Cen.	Pullman	Motor	1926	130	60,000	150,150	140,000	10,150	6.7
3	Ill. Cen.	Std. Steel Car	Trailer	1926	85	26,500	96,450	88,700	7,750	8.0
4	Pennsylvania	Pennsylvania	Motor	1926	8	44,500	124,450	111,350	13,100	10.5
5	Alton & Southern		Loco.	1926	1	.....	.....	.....	.....	...
6	Alton & Southern		Loco.	1927	1	.....	.....	.....	.....	...
7	C. & N. W.	A. C. & F.	Pass.	1927	20	27,600	106,600	99,600	7,000	6.6
8	C. & N. W.	Pullman	Pass.	1927	40	27,600	106,600	99,600	7,000	6.6
9	C. & N. W.	Std. Steel Car	Pass.	1927	40	27,600	106,600	99,600	7,000	6.6
10	C. & N. W.	A. C. & F.	Comb.	1927	20	27,600	106,300	99,300	7,000	6.6
11	Ill. Cen.	Pullman	Trailer	1928	10	26,500	96,450	88,700	7,750	8.0
12	Ill. Cen.	Pullman	Motor	1928	10	60,000	150,150	140,000	10,150	6.7
13	Alton & Southern		Loco.	1928	1	.....	.....	.....	.....	...
14	Northwest. Pac.	St. Louis Car	Trailer	1929	5	.....	85,050	79,000	6,050	7.1
15	Northwest. Pac.	St. Louis Car	Motor	1929	5	.....	116,650	110,000	6,650	5.7
16	Var. chemical companies	Std. Tank Car	Tank	1929	35	25,650	42,100	33,700	8,400	20.0
17	Var. chemical companies	A. C. & F.	Tank	1929	6	25,650	42,100	33,700	8,400	20.0
18	C. & N. W.	Std. Steel Car	Comb.	1929	5	27,600	106,300	99,300	7,000	6.6
19	C. & N. W.	Std. Steel Car	Pass.	1929	20	27,600	106,600	99,600	7,000	6.6
20	Northwest. Pac.	St. Louis Car	Motor	1930	5	.....	.....	.....	.....	...
21	Northwest. Pac.	St. Louis Car	Trailer	1930	5	.....	.....	.....	.....	...
22	D. L. & W.	Pullman	Motor	1930	141	.....	150,414	147,200	3,214	2.1
23	Reading	Bethlehem	Motor	1930	70	44,600	134,806	125,400	9,406	7.0
24	D. & H.	D. & H.	Loco.	1930	1	.....	.....	.....	.....	...
25	Pennsylvania	Pennsylvania	Loco.	1930	8	.....	360,000	299,520	60,480[4]	16.8
26	Alton & Southern		Loco.	1930	1	.....	.....	.....	.....	...
27	Indiana R. R. Sys.	A. C. & F.	Motor	1931	14	.....	.....	.....	.....	...
28	Indiana R. R. Sys.	Pullman	Motor	1931	21	.....	.....	.....	.....	...
29	Var. chemical companies	Std. Tank Car	Tank	1931	4	25,650	42,100	33,700	8,400	20.0
30	C. of N. J.	Pressed Steel	Pass.	1931	25	.....	.....	.....	.....	...
31	Alcoa Ore	Canton Car	Hopper	1931	10	20,000	60,100	38,900	21,200	35.2
32	Phila. & Western	J. G. Brill	Motor	1931	10	26,770	60,000	52,400	7,600	12.6
33	Pennsylvania	Pennsylvania	Hopper	1932	1	16,000	37,300	31,300	6,000	16.1
34	Pennsylvania	Baldwin	Loco.	1932	54	.....	406,700	375,000	31,700	7.8
35	Pennsylvania	Gen. Elec.	Loco.	1932	25	.....	406,700	375,000	31,700	7.8
36	Pennsylvania	Pennsylvania	Loco.	1932	13	.....	406,700	375,000	31,700	7.8
37	Clark Equip. Co.	Clark Equip. Co.	Motor	1932	1	6,500	52,500	30,000	22,500[5]	43.0
38	Fonda, Johnston & Gloversville	J. G. Brill	Motor	1932	5	26,770	60,000	52,400	7,600	12.6
39	Long Island	Pennsylvania	Trailer	1932	1	28,600	110,900	71,800	39,100	35.3
40	Phila. & Westchester Tr. Co.	J. G. Brill	Motor	1932	5	.....	.....	.....	.....	...
41	Reading	Bethlehem	Motor	1932	30	44,600	134,806	125,400	9,406	7.0
42	Var. chemical companies	Gen. American Tank Car	Tank	1933	4	25,650	42,100	33,700	8,400	20.0
43	Var. chemical companies	A. C. & F.	Tank	1933	4	25,650	42,100	33,700	8,400	20.0
44	Pullman Co.	Pullman	Obser.-sleeper	1933	1	27,000	.....	96,980	.....	...
45	Pullman Car & Mfg. Corp.	Pullman	de luxe coach	1933	1	18,000	.....	73,880[6]	.....	...
46	Union Pacific	Pullman	Artic. train	1933	1	.....	.....	.....	.....	...

Statistical Record of the Use of Aluminum in Railway Equipment

Statistical Record of the Use of Aluminum in Railway Equipment

	Number seated passengers	Weight per seated passenger, lb.			Overall length Ft.—In.	Weight per linear foot, lb.			Aluminum applications
		Steel or composite[1]	With aluminum	Saved		Steel or composite[1]	With aluminum	Saved	
1	84	1,098	1,042	56	72—7½	1,270	1,206	64	All sheet in superstructure, except outside sheet, doors, conduit and fittings.
2	84	1,788	1,667	121	72—7½	2,069	1,929	140	
3	84	1,148	1,056	92	72—7½	1,329	1,222	107	
4	72	1,728	1,547	181	64—5¾	1,929	1,726	203	Superstructure, doors, conduit and fittings.
5	..	....	....	...	..	....	....	...	
6	..	....	....	...	..	....	....	...	
7	98	1,088	1,016	72	79—3¼	1,345	1,257	88	All sheet in superstructure.
8	98	1,088	1,016	72	79—3¼	1,345	1,257	88	
9	98	1,088	1,016	72	79—3¼	1,345	1,257	88	
10	72	....	....	...	79—3¼	1,341	1,253	88	All sheet in superstructure, except outside sheet, doors, conduit and fittings.
11	84	1,148	1,056	92	72—7½	1,329	1,222	107	
12	84	1,788	1,667	121	72—7½	2,069	1,929	140	
13	..	....	....	...	..	....	....	...	
14	103[2]	826	767	59	72—10½	1,168	1,085	83	Roof sheet, interior finish, seats, conduits and fittings.
15	98[2]	1,190	1,122	68	72—10½	1,602	1,510	92	
16	8,000[3]	....	....	...	32—5⅝	1,295	1,037	258	Entire tank and fittings, including heating coils.
17	8,000[3]	....	....	...	32—5⅝	1,295	1,037	258	
18	72	....	....	...	79—3¼	1,341	1,253	88	All sheet in superstructure.
19	98	1,088	1,016	72	79—3¼	1,345	1,257	88	
20	..	....	....	...	..	....	....	...	
21	..	....	....	...	..	....	....	...	
22	84	1,790	1,750	40	70—3½	2,142	2,096	46	Roof sheet and interior finish.
23	62	2,180	2,020	160	72—0	1,870	1,740	130	Roof, doors, interior finish, motor and control parts. Cab.
24	..	....	....	...	..	....	....	...	
25	..	....	....	...	46—10	8,800	7,330	1,470[4]	Cab and apparatus deck.
26	..	....	....	...	..	....	....	...	
27	..	....	....	...	..	....	....	...	
28	..	....	....	...	..	....	....	...	
29	8,000[3]	....	....	...	32—5⅝	1,295	1,037	258	Tank and fittings, including heating coils.
30	..	....	....	...	..	....	....	...	
31	..	....	....	...	41—11	1,440	930	510	Body and underframe.
32	52	1,150	1,007	143	55—2	1,090	950	140	Superstructure, inside finish, underframe.
33	..	....	....	...	35—0	1,065	895	170	Side, end, floor sheets and doors.
34	..	....	....	...	62—8	6,250	6,000	250	Cab and apparatus deck.
35	..	....	....	...	62—8	6,250	6,000	250	
36	..	....	....	...	62—8	6,250	6,000	250	
37	42	1,250	715	535	59—2	886	507	379	Underframe, superstructure and appliances.
38	52	1,172	1,007	165	55—2	1,090	950	140	Superstructure, inside finish, underframe.
39	120	924	600	324	72—0	1,540	1,000	540	Underframe, superstructure, inside finish, fittings.
40	..	....	....	...	..	....	....	...	Superstructure, inside finish, underframe.
41	62	2,180	2,020	160	72—0	1,870	1,740	130	Roof, doors, interior finish, motor and control parts.
42	8,000[3]	....	....	...	32—5⅝	1,295	1,037	258	Entire tank and fittings.
43	8,000[3]	....	....	...	32—5⅝	1,295	1,037	258	
44	..	....	....	...	84—9¼	....	....	...	Entire underframe, superstructure and trucks, except wheels, axles, springs and wearing parts.
45									
46	..	....	....	...	..	....	....	...	

[1] In the majority of cases no similar equipment exists in steel or composite-steel construction.
[2] Because of the 3/2 seating arrangement, seating capacity per square foot is greater.
[3] Capacity in gallons.
[4] Some weight saving accomplished by redesign of parts not aluminum.
[5] Trucks not aluminum, but were lighter due to aluminum car.
[6] Includes weight of air-conditioning equipment of 6,880 lb. This equipment also made of aluminum.



Reading Suburban Multiple-Unit Cars with Roof, Doors, Interior Finish and Traction Motors of Aluminum

except, of course, the wheels, axles and springs. In each of the three cars, the weight saving ranged from 28.7 per cent to 36.3 per cent.

While the 800 cars of the Board of Transportation, New York, for use on the Eighth Avenue Subway, are by no means as broad an application for aluminum as is found in many of the electric street cars, nevertheless, they account for a large tonnage of aluminum. In the construction of the 800 cars, approximately 2,400,000 lb. of aluminum was used and represents a saving in dead weight per car of between 5.2 and 9.1 per cent.

[In connection with an article published in the August 22, 1931, issue of the *Railway Age,* page 283, there appeared in tabular form a statistical record of the use of aluminum on city electric railways. In addition to the applications of aluminum recorded in the table published at that time 12 trolley buses were built in 1932 for the Wisconsin Gas & Electric Company, Kenosha, Wis.; 1 rail coach was built in 1930 for the Chicago & Joliet Electric Railway, and 500 additional multiple-unit motor cars were built in 1932 for the Board of Transportation, New York City.—Editor.]

Important Factors in Aluminum Construction

Aluminum's success during its 10 years of application on the railroads can be attributed largely to its exceptionally good strength-weight ratio. Aluminum and its alloys can be extruded into many intricate forms and shapes which lend themselves readily to car construction. In many instances, these extruded sections greatly facilitate assembly and reduce labor cost to such an extent that the additional cost of the material is more than offset. Undesirable joints can also be avoided and a smoothness of outline which contributes so much to appearance is thus made possible. This, of course, is in line with the present-day practice of streamlining.

The safety of the aluminum car, properly designed has been demonstrated by the excellent behavior of several aluminum cars in collision and derailment. Thorough investigations of the relative safety of aluminum structures as compared with structures fabricated from other materials have shown that the high-strength aluminum-alloy structures possess a greater ability to cushion impact than those of other materials. It can also be shown that it takes a greater blow to produce the same stress in high-strength aluminum-alloy structures than in identical structures of other materials. This factor of safety is further enhanced by the fact that an aluminum-alloy car structure can be built with a fair amount of bulk and still retain its lightness. In other words, metal may be left in the structure where it is desirable to absorb secondary stresses occurring in collision or accident without greatly affecting the economic design. As a result of the lower modulus of elasticity of the metal, aluminum structures must generally be somewhat more bulky than similar sections designed for materials having a high modulus of elasticity, although not in the ratio of their respective moduli. Properly designed, aluminum structures, for example, will weigh about 40 per cent of ordinary structural-steel sections of equal strength and deflection. In comparison with high-strength alloy or stainless-steel structures, an aluminum structure of equal weight can be built with approximately twice the thickness of metal.

In the case of fire, where inflammable material comes in contact with aluminum, the heat is dissipated extremely fast through an aluminum structure and localized fires will have no tendency to anneal or destroy the strength of the aluminum. Electric fires, such as arcing grounds, tend to go out more quickly with less destruction than in the case of other metals having less heat conductivity.

Since the initial application of aluminum in 1923, a conservative policy has been followed in the development of the use of the metal. While the alloys used in the first and subsequent applications had already demonstrated their practicability in aircraft, they were, nevertheless, new to the equipment engineers of the railroads, and it is only natural that their use in railroad rolling stock should have progressed in a gradual manner. Then, too, at the outset there were limitations in manufacturing possibilities, but these have been overcome and, at the present time, all-aluminum car construction is a definite commercial reality.

Aluminum, in its 10 years of service, not only has proved its worth, but has progressed farther than any other car building material in a similar length of time. Its first applications have demonstrated conclusively that the metal has satisfactory life for car building purposes, and today, the railroads no longer look upon the use of aluminum as a new development but one which has and which will continue to reduce effectively and economically the dead weight of their structures without sacrifice of either strength or safety.

* * *

A Section of the New York Central's Visitors' Lounge in the Travel and Transport Building at the Century of Progress Exposition—An Historic Display of Model Vehicles up to the Present-Day Locomotive is Featured in This Lounge

Eastman Seeks Salary Reductions

Federal Co-ordinator confers with regional committees, asks lower pay for psychological effect

WASHINGTON, D. C.

FURTHER reduction in the salaries of the higher railroad executives, on the ground that although they represent only "an insignificant item compared to the sum total of railroad expenses" they are popularly regarded as excessive and a reduction would have a beneficial psychological effect, was suggested by Joseph B. Eastman on July 14 in his first meeting with the regional railroad co-ordinating committees in his capacity as federal co-ordinator of transportation. Saying he knew that salaries have already been reduced, he asked the railroad executives to consider whether the salaries at or near the top have been reduced enough, in view of prevailing conditions. He added that he was not passing out censure for what has been done and that the salaries which many executives attained were "symptoms of the boom disease and not a subject for personal blame."

Although no reference was made to the possibility of an order on the subject Mr. Eastman apparently suggested that it was within his authority under the law creating the office of co-ordinator when he said he was putting the question up to the executives, "as I must do in the first instance under the law," because he believed "there must be an adjustment of this matter of salaries before the railroads will stand right with the shippers, investors, and labor under the conditions which now exist." His earlier action in bringing about an agreement to postpone the railroads' proposal for a further reduction in wages had been undertaken at the request of the President in an unofficial capacity.

The salary suggestion was included in a statement presented by Mr. Eastman at a conference attended by members of the three regional committees selected by the railroads, members of the co-ordinator's organization, R. V. Fletcher and Alfred P. Thom of the Association of Railway Executives, and M. J. Gormley, president of the American Railway Association, at which methods of procedure and the ground to be covered were discussed. Arrangements were made for later meetings between the railroad committees and the co-ordinators' regional organization. Mr. Eastman's statement follows.

Eastman's Conception of Purpose of New Law

The appointment on these regional co-ordinating committees of distinguished railroad executives I regard as good evidence that the railroads of the country will co-operate to the utmost in a joint endeavor with me to achieve the purposes of the Emergency Railroad Transportation Act, 1933. I thank you for your willingness to serve.

At the outset of our joint undertaking, it may not be amiss to give you briefly my conception of the purposes of that Act. It was not designed as the final answer to the transportation problem. The hope is rather that it will be the means of finding the answer. It has two main purposes. One is to explore thoroughly ways of improving the net earnings of the railroads by avoiding what the Act calls "wastes and preventable expense." The original thought centered around the drain on net earnings which many believe is caused by the unnecessarily keen competition and rivalry of the railroads with each other, and their inability to act together for the common good in ways which would imperil no public interest. The Act as finally passed, however, covers other unnecessary and undue burdens on net earnings.

Some of you, I know, doubt whether there is much burden of this character. I believe that it exists, but I do not know its extent. It is our duty under the Act to find out, and that duty will, I am sure, be performed with your co-operation.

Some have looked upon this search for waste and preventable expense as merely a project for limiting and curtailing service. If I thought of it as that, I would not be for it. More than ever it is important, with the competition by which railroads are now confronted, for them to give not only good but better service. They cannot afford to wean away traffic. That will drain away net earnings quite as effectively as any unnecessary expense. It is my hope that in our search for economies we shall find means of improving service, both freight and passenger, and shaping it to meet present-day conditions.

When it comes to savings which involve reductions in labor, we shall be hampered in early accomplishment by the restrictions upon such reductions which the Act contains. Perhaps it is just as well, for the great immediate need of the country is an increase in the employment and purchasing power of its people, and no one wishes to run any risk of checking the upward trend which now seems under way. However, I have a very firm and abiding conviction that in the long run it is essential to the best interests of the railroad employees themselves that the railroads should be operated with the maximum economy consistent with good service and right living conditions for those who work for them. The future of the railroads, with all the competition and changing conditions which confront them, is too hazardous to permit wisely of anything else. For this reason the search for savings, even if their realization is postponed, will amply justify itself.

New Ideas Desired

As you are aware, I pretend to no technical expert knowledge of railroad operation. My main function, so far as this part of the Act is concerned, is to be a nucleus for joint endeavor, to inspire and promote it, and even to require it, if that proves necessary. I shall have at my command an organization which will supply some of my own technical deficiencies, and in choosing that organization my aim has been to select men who think that improvement is possible. Some of them are proponents of plans or have ideas which it may be that many of you do not accept. They have been chosen, not because I myself am committed to any particular plans or ideas, but because we shall never get anywhere in our search if we do not have with us those who think there is something to find.

In the course of our conference today, I shall discuss with you at some length the ground which I believe must be covered in our search.

I turn now to the second purpose of the Act. It is, in my judgment, of even more importance than the first. The duty which is imposed upon me, in accordance with this second purpose, is to plan out and recommend through the Commission to the President and to Congress further legislation of a more permanent character which will improve transportation conditions generally. Not the railroads alone are included within this purpose, but all transportation agencies upon which the commerce and industry of the country depend. In this instance the Act does not join you with me in the duty, no doubt because you have one special interest out of many which must be considered. Nevertheless I shall want your help, as well as the help of others.

You and I know, and the country knows, that transportation has been drifting with accelerating speed toward a state of chaos. Conditions are highly unstable and uncertain and satisfy neither carriers, investors, shippers, labor, nor the public generally. They resemble the conditions which caused the creation of the Interstate Commerce Commission in 1887. The economic depression has been a great factor in recent railroad troubles, but the disturbing conditions which most threaten the transportation future are the product of the rapidly-developing competition from new and unregulated sources.

An Ideal Transportation System

I think I can picture the situation which we would all like to see exist. The various transportation agencies would form more of a transportation system than we now have, a system in which each agency, whether it be railroad, waterway, motor vehicle, airway, or pipe line, would play the part which it is best fitted to play, with a minimum of duplication and destructive competition. In the competition remaining there would be no unfair advantages. There would be reasonable stability in rates and

charges, under effective Government regulation, affording a firm foundation for the transaction of commerce and industry. The transportation business would be conducted on sound financial principles, under Government supervision or control, with management freed from exploiting influences. A sound basis would exist for the credit which the transportation industry will need under progressive management, if it is to adjust itself to new conditions and furnish the service and charge the rates which the country ought to have. Labor would have fair wages and satisfactory working conditions, and be able to co-operate with the management for the good of the industry and the country.

This is a thumb-nail sketch of the ideal as I see it. No doubt we shall fall considerably short of the ideal. We always do. But at least it sets a mark at which to aim. It will be my purpose to canvass the whole situation to the best of my ability, to marshal the available facts, to review the experience of other countries, to consult with those who have given real thought to the subject, and to draw upon my own knowledge and experience. I have no preconceptions which are fixed and immutable.

Reductions of Fixed Charges

In this connection one matter deserves special mention, because it seems to me that it has been the subject of misunderstanding and misconceptions. That is the matter of railroad fixed charges. Some seem to think that a railroad can reduce fixed charges in much the same way that it cuts expenses. In fact fixed charges are debts, and I know of no way in which a debtor can reduce his debts except by consent of his creditors or through insolvency or bankruptcy proceedings. The new Bankruptcy Act and the old process of receiverships provide means whereby railroads can reorganize and reduce their fixed charges when they are no longer able to pay them; but insolvency and inability to pay are essential to any such proceedings.

One stated purpose of the Act is "to promote financial reorganization of the carriers, with due regard for legal rights, so as to reduce fixed charges to the extent required by the public interest and improve carrier credit." The provision for accomplishing this purpose is the only one that is feasible, namely, that the Commission shall not approve a loan to a railroad by the Reconstruction Finance Corporation, "if it is of the opinion that such carrier is in need of financial reorganization in the public interest." This means that the Government will not keep an insolvent carrier's head above water when that carrier ought to take the opportunity which the Bankruptcy Act provides to reorganize and scale down its fixed charges. But I have no power to require reductions in fixed charges, and could be given no such authority. Reorganizations are within the jurisdiction of the Commission under the Bankruptcy Act and are not within the province of the Co-ordinator.

Nevertheless the railroads are laboring under a very heavy burden of debt, and that is a fact which must be considered in connection with the national railroad policy for the future. It cannot be overlooked or minimized. It has a most vital bearing on the question of the ability of the railroads to raise the capital funds which they will most certainly need. In short it is a factor of the greatest consequence in considering recommendations for further legislation.

The Salary Question

I come now, and finally, so far as this statement is concerned, to a matter which concerns you most intimately and which I have felt that I ought to take up with you publicly and in the frankest possible manner. I refer to the matter of railroad salaries. I realize fully that in dollars and cents it is an insignificant item compared to the sum total of railroad expenses. Nevertheless it has a psychological importance which much exceeds its money significance, and consideration of it cannot and ought not to be avoided.

The railroads have been paying to various chief executives, and to some others, salaries which I believe that the people of the country quite generally regard as excessive and unjustified. The railroads are not alone in this. On the contrary, these salaries reflect a situation which has been general in big business, and I can well appreciate the difficulty which the railroads might experience in holding good men, under normal conditions, if they should adopt a standard of salaries radically lower than that which prevails elsewhere in the business world. I also freely confess that I find great difficulty in arriving at any abstract rule for the determination of proper salaries. In the Government service, very low salaries are paid for important work, at least compared to those which big business pays, but there is a compensation in working directly for the public which does not exist to the same extent in serving private interests. However, railroad executives do work which is very much affected with a public interest.

My belief is that a danger now exists in the fixing of salaries for executives in private business which did not once exist, and which grows out of the fact that great corporations with widely-held stock are not really controlled by the legal owners of their properties, but rather by boards of directors who tend to become self-perpetuating and who may have a comparatively small financial stake in the industry. It is easy for the directors to drift into the conclusion that the executives, fellow-members of these boards, are justly entitled to very large compensation for their services. The question is not viewed through quite the same glasses as an actual owner of the property might use.

A good executive may be worth hundreds of thousands of dollars to his railroad, as compared with a poor executive, but I cannot believe that there is such a dearth of good material that it is necessary to pay the salaries which have been paid in order to get good men. Nor do I know of any reason to believe that the competency of executives can be safely judged by the salaries which they receive. Moreover, a railroad presidency is a job which ought to have much attraction quite apart from the money which it pays.

However, my term of office is short and I am going to take this matter up with you solely on the basis of existing conditions. I shall not ask you to consider what fair salaries, consistent with proper economy, may be in those future days when prosperity is restored, but only what they should be now. This country has been and still is suffering to a degree that it probably never has suffered before. Millions are out of work. Still more millions are living on a pittance. Thousands of railroad employees have no jobs at all, and thousands more are working on part time. Thousands of investors in railroad securities are receiving no return. I know that salaries have been reduced, but I ask you to consider whether they have been reduced enough, in view of prevailing conditions, and what I am talking about are the salaries at or near the top.

It will be easy for you to get your backs up on this matter, but I ask you not to let that happen. I believe you will understand that I am not trying to bully-rag you, nor to appeal to the galleries. Nor am I passing out censure for what has been done. The salaries to which many executives attained were a symptom of the boom disease, and not a subject for personal blame. I am putting the question up to you, as I must do in the first instance under the law, because I believe very sincerely that there must be an adjustment of this matter of salaries before the railroads will stand right with the shippers, investors, and labor under the conditions which now exist. The executives have much more to gain by such an adjustment than they can possibly lose. I greatly hope that you will consider this subject in the spirit in which I have attempted to present it to you, and that with your help the executives will themselves be able to accomplish a reasonable adjustment.

Having unburdened myself frankly on this troublesome subject, I want to end this statement, as I began it, by expressing my hearty appreciation of your willingness to serve on these regional co-ordinating committees. It is my desire to co-operate with you in every reasonable way, and to get results, wherever possible, through the voluntary action of the railroads. I believe that our relations will be pleasant and that you will give me your full co-operation.

Reductions Part of Government Policy

The idea that executive salaries should be reduced had already become a part of the policy of the federal government, as indicated by the law passed by the last Congress under which the Reconstruction Finance Corporation has been requiring reduction of salaries to figures which it considers reasonable as a condition for the authorization of loans. Under this law the railroads which have obtained new loans recently have been required to readjust salaries and many others have been brought under similar requirements when they have applied for renewals at a reduced rate of interest. The corporation, however, has been considerably more liberal in this respect than the Senate, which had sought to impose a limit of $17,500, and nearly half of the Class I railroads have not come within this restriction because they have not asked for government loans.

A report on railroad salaries furnished the Senate last year by Commissioner Eastman, followed by a supplemental report as of March 1, 1933, furnished just before Congress adjourned, showed that most railroad officers' salaries had been reduced all the way from 10 to 50 per cent, but it also showed that a number of the

(*Continued on page 156*)

Better Maintenance Will Reduce Stresses in Rail*

Greater uniformity of support and less variation in play from tie to tie will pay high dividends against maintenance costs

By Dr. A. N. Talbot†

Professor Emeritus, University of Illinois, Urbana, Ill.

A YEAR ago I presented information relating to the variability in what is called heavy, high-grade, stiffly ballasted track, in an effort to illustrate some of the defects and disadvantages that have become more marked by increasing the size of rail and especially by the great increase in the thickness and stiffness of the ballast foundation. The data that were presented showed that there is marked lateral bending of the rail from point to point and from tie to tie, first inwardly of the track and then outwardly, quickly changing from tie to tie, the stress at one edge of the base of rail sometimes being three times the average stress along the track, all for centrally applied loads. These data also showed large changes in the mean stress in the base of rail, ranging from 0.3 of the average stress along the track to 1.6 times the average stress, all for static loading.

Tests Made on Two Lines

Again, the tests showed extreme variations in the division of the load carried by adjacent ties, varying from zero to 2.6 times the average share of the load. Also, the bearing of the rail on the tie plate and of the tie plate on the tie was found to be irregular and uneven. Sometimes the centroid of the load applied by the rail was near one edge and sometimes near the other. The adzing for the tie plates was not regular. A gage the thickness of a sheet of paper could be placed under the tie plate over one portion of the bearing area when the rail was loaded; sometimes even the edge of a shovel or the thickness of a knife blade, and adjacent tie plates were far from being in the same plane. To keep these conditions clearly in mind, it seems well to repeat two of the diagrams that were given last year and to follow these with others representing vertical and lateral bending moments from point to point. Tests to determine this variability were made on two lines, which will be designated A and B. The results of the tests on Track A will be given first, followed by results of tests on Track B.

*From a lecture given before the convention of the American Railway Engineering Association at Chicago on March 14. That part of his talk relating to rail joints was abstracted in the issue of June 24, page 893.

†Chairman of the Joint Committee on Stresses in Track.

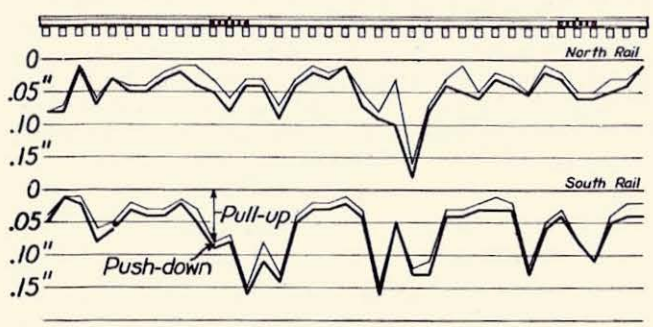


Fig. 1. Play Between the Rail and the Tie Bed

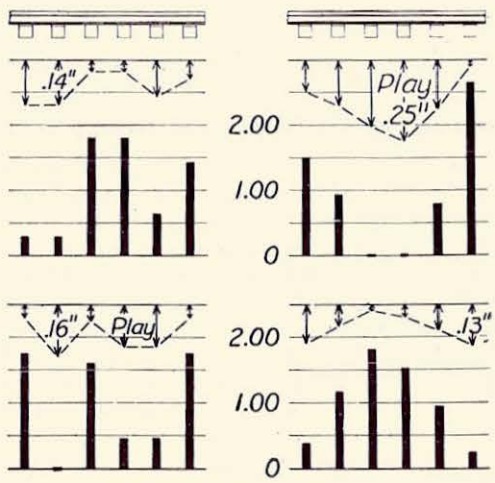


Fig. 2. Variation in Tie Loads

Greater Care Needed in Surfacing

The play between the rail and tie bed in one location along Track A, as found from pull-up and push-down tests, is shown in Fig. 1. The variation in play at nearby points before getting a firm support for the rail ranged from nothing to 0.18 in. Surely the rail will not be able to bend enough to give an even bearing on adjacent ties. Some ties will carry little of the load, others much, perhaps more than they should. The stresses in the rail at places will be far greater than normal. What would a track engineer think of embedding ties in a concrete base and leaving such variability as this in the levels of the rail-bearings over the ties? And yet the stiffness of an old, well-consolidated broken-stone ballast foundation on an established roadbed approaches that of concrete and the effects of unevenness and irregularities in the one are much the same as in the other. Should not the care given to the surfacing be such as to remedy some of these defects?

Figure 2, which shows variations in the tie loads, was also given a year ago. Tie loads on ties in the same group varying from zero to 2.6 times the average or expected load were noted. Similar conditions are to be found on much so-called high-grade track. Both ties and ballast are mistreated. The extra cost of greater uniformity is not large in comparison with the cost of rail

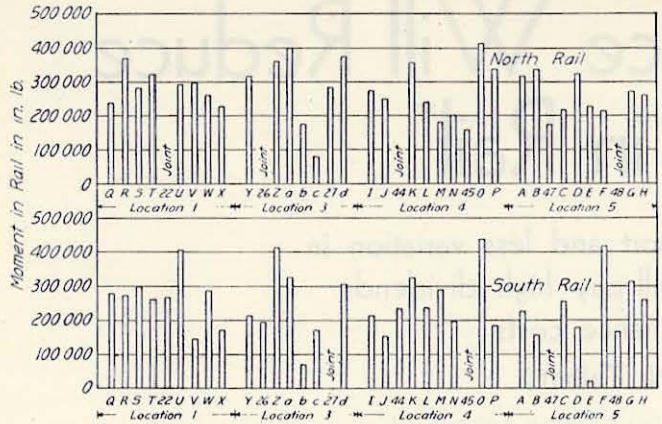


Fig. 3. Vertical Bending Moment in 130-lb. Rail at Rear Wheel as It Moved Along Track A

and sub-structure. It is the maintenance methods that are at fault.

Both Vertical and Lateral Bending Moments are Large

Values of the vertical bending moment found in 130-lb. rail at the rear wheel when the car was moved two tie spaces at a time along Track A, on which the foregoing tests were made, are shown in Fig. 3. The magnitudes of these moments are, of course, proportional to the mean stress in the base of rail. The moments range from 20,000 to 440,000 inch-pounds, with an average of 280,000 inch-pounds. The variation in moment is due principally to the variations in the tie pressures just referred to and to the moment arm of these reactions. The marked changes in value from point to point along the track are very striking.

Figure 3 is based on the mean of the stresses at the two edges of base of rail, but for Fig. 4 the difference in stress at the two edges is used to determine the lateral bending moment in the rail at the same spots, the magnitudes of these moments being shown. From this diagram one can easily note the lateral bending of the rail inward and outward and the varying magnitudes of the forces tending to cause it, which, of course, involve corresponding twisting. The magnitude of the lateral bending moments may not be troublesome for the 130-lb. rail, but the effect on the ties and ballast bed and on maintenance is not to be measured by the stresses in this rail.

Vertical bending moments were also observed in 110-lb. rail at the rear wheel as the car was spotted at every second tie space along Track B of another railroad. The load in this test was somewhat lighter, however, being 26,500 lb. per wheel instead of 30,000 lb. as in the previous tests. The track where this test was made is well and deeply ballasted. The stretches at locations 1, 2 and 3, which are shown in the table, have hard limestone ballast well compacted, and the track substructure is very stiff, in fact, the stiffest we have yet tested. The stretch at location No. 4 has flint-gravel ballast and is less stiff, though this substructure has more than average stiffness. Except for five low values, the moments observed in the rail on the very stiff ballast at locations 1, 2 and 3 differ from the average moment by an average variation of only 17 per cent, and the variation on the gravel ballast (Location 4) is even smaller.

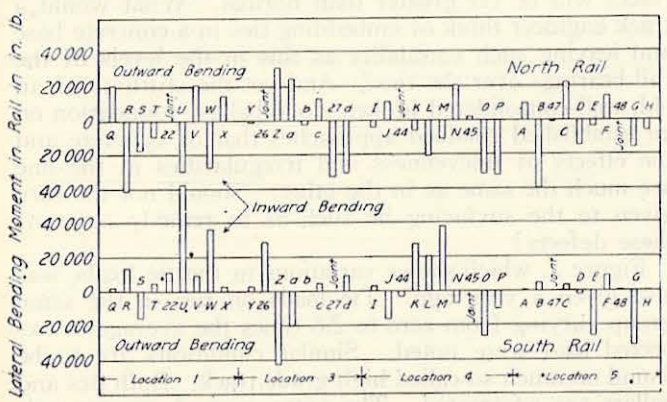


Fig. 4. Lateral Bending Moment in 130-lb. Rail at Rear Wheel as It Moved Along Track A

The magnitudes of the lateral bending moments in the 110-lb. rail of Track B were remarkably small. At the 52 places measured, the average of the numerical values of the lateral bending moment in this rail was only 1.4 per cent of the average vertical bending moment, while the maximum lateral moment was only 5 per cent of the vertical moment. In considering this comparison between the two rail sections, it should be remembered that the section modulus of the 110-lb. rail with respect to its vertical axis is 0.19 of that with respect to the horizontal axis. The lateral bending due to static loading is very small on this track.

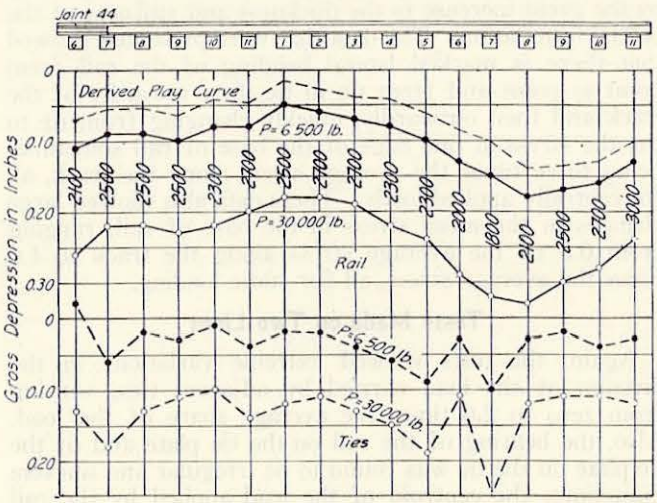


Fig. 5. Gross Depression of Rail and Tie and Corresponding Value of u by Approximate Method

In the GEO track on which the last tests were made (Track B) the ties were pre-adzed and pre-bored in such a way as to give a full and even bearing of the tie plates on the ties and to bring the upper bearing surfaces of the tie plates into the same plane from tie to tie along the track, with a further chance for slight adjustment by means of the wood shim under the rail. This uniformity of bearing is not peculiar to this type of track construction, however, for pre-adzing and pre-boring and the firm fastening of tie plate to tie have been used for some years in this country. Since the tie plates are held firmly to the tie and the rail is held to the tie plate, the main source of vertical play is between the tie and its bed in the ballast. This and the natural variation in stiffness of the ballast itself remain as the principal sources for variations in vertical moments from point to point along the track for static loading.

Stiffness of the Substructure

In Fig. 5, the gross depression of rail and tie is given for one of the test locations on Track B which in this case was laid with 130-lb. rail. The marked play shown at the right of the stretch was apparent by visual inspection. For the wheel load of 30,000 lb., which was

used in this test, the gross depression of the rail, as is shown in the upper part of the figure, ranged from 0.18 in. to 0.33 in. In the lower part of this diagram it is shown that the gross depression of the tie for the heavy load ranges from 0.10 to 0.25 in. Further, the diagram indicates very clearly that there is a marked variation in the loads taken by the ties. The primary purpose of showing this diagram is to bring out and emphasize that there is a large variation in the values of the modulus of elasticity of rail support u, which here was calculated by an approximate method using the value of the net rail deflection at the rear wheel for each position of load. The values of the modulus so calculated are written below each tie. Even though the stiffness of the 130-lb. rail aids in bridging over poor supports, the modulus ranges from 1,800 to 3,000 within four tie spaces.

At the left of the accompanying table values are given of the modulus of elasticity of rail support, u, for five locations on the track first referred to (Track A, 130-lb. rail). The average value of 2,600 lb. per in. per in., represents a very stiff rail support, as track usually runs. At the right similar values are given for six locations on the second track (Track B, 110-lb. rail). For the limestone ballast the moduli indicate a very stiff rail support, averaging 5,100, by far the stiffest we have yet encountered. Part of this extreme stiffness is due to initial compression of the ties by fastening the tie plates with screw spikes. This also applies to the flint-gravel ballast, which has an average value of 2,900, a value that is extremely high for gravel. It may be well to remark that for stiff ballast, medium variations in the modulus from location to location along the track probably cannot be avoided. It is the variation in stiffness and uniformity from tie to tie and from one group of ties to another nearby that needs to be remedied, since these are the defects that are responsible for the great variations that occur in stresses in rail and in tie and ballast loads.

Modulus of Elasticity of Rail Support u

Track A Location		Track B Location	Ballast	
1	2500	1	Limestone	3700
2	2900	2	"	5500
3	2200	3	"	6200
4	2600		Average	5100
5	2600	4	Flint	2500
Average	2600	5	"	2600
		6	"	3600
			Average	2900

The value of u is given in pounds per inch per inch of one rail

Finally, careful consideration should be given to reducing so far as possible the present variability factors in track maintenance—a topic that was discussed in some detail at the meeting a year ago*. The great increase in the stiffness of the track structure in recent years has brought new problems that should not be overlooked. With deep consolidated ballast, the average net depression of the rail under load has decreased greatly in high-grade track, perhaps sometimes to a third of what it was a few years ago. At the same time, however, the variation from tie to tie of the play of the rail on its support probably has changed but little, perhaps it has increased from that on less rigid ballast. The variation in bearing of the rail on the tie plate and tie has as yet received scant consideration; the proper adzing of the ties will pay good dividends against maintenance costs. In our satisfaction in possessing heavy rail and deep ballast, have we not neglected to make progress in important accompanying matters relating to the economics of maintenance? Altogether a little extra cost, perhaps only a better directed effort at uniformity, will relieve the track of some of the sources of maintenance troubles.

*See *Railway Age* for June 25, 1932, page 1059.

Santa Fe Earned Charges 1.63 Times Last Year

THE Atchison, Topeka & Santa Fe System in 1932 had gross revenues totaling $133,133,537, representing a decline of more than 50 per cent from 1929. Nevertheless, so conservatively is the company capitalized and so carefully were operating expenses kept under control that earnings available to meet bond interest were equivalent to 1.63 times such charges. These and other revenues and expenses figures comparing the years of prosperity and depression are given in Table I. The decline in revenues was met by a reduction in maintenance of way expenses by 63 per cent, maintenance of equipment expenses by 35 per cent and transportation expenses by almost 40 per cent. The reduction in maintenance of way expenses, while apparently considerable, is accounted for in part by the fact that such expenses in 1929 were relatively heavy—the Santa Fe's outlay per equated track mile in that year being exceeded by those of only two major roads in the Central Western region.

Table I—Santa Fe System—Selected Statistics of Revenues and Expenses—1932 and 1929 Compared

	1932	1929	+Increase −Decrease Per Cent
Freight Revenue	$107,400,213	$204,551,491	−47.5
Passenger Revenue	14,520,805	37,926,205	−61.7
Total Operating Revenue	133,133,537	267,189,178	−50.2
Maintenance of Way Expenses	15,342,513	42,175,626	−63.6
Maintenance of Equipment Expenses	31,536,603	48,439,076	−34.9
Transportation Expenses	43,997,002	73,011,041	−39.7
Total Operating Expenses	101,918,322	175,243,236	−41.9
Net Revenue from Railway Operations	31,215,214	91,945,941	−66.0
Taxes	12,824,969	20,340,961	−37.0
Railway Operating Income	18,352,676	71,550,424	−74.4
Net Railway Operating Income	17,659,793	68,652,330	−74.3
Gross Income	20,899,751	74,480,224	−71.9
Deductions from Gross Income	12,804,313	12,766,878	+0.3
Net Income	7,545,007	61,036,803	−87.6
Dividends	8,667,521	30,447,244	−71.5

Table II—Atchison, Topeka & Santa Fe—Selected Operating Statistics, 1932 and 1929 Compared

	1932	1929	+Increase −Decrease Per Cent
Net Ton-Miles (thousands)	8,531,059	15,970,434	−46.6
Freight Train-Hours	875,719	1,482,605	−40.9
Average Cars Per Train	44.8	52.3	−14.3
Average Net Tons Per Train	539	704	−23.4
Average Net Tons Per Car	19.9	21.9	−9.1
Average Freight-Train Speed, Miles Per Hour	18.1	15.3	+18.4
Gross Ton-Miles Per Train-Hour	30,122	29,908	+0.7
Lb. Coal Per 1000 Gross Ton-Miles	108	110	−1.8
Per Cent Freight Cars Unserviceable	10.3	5.9	+74.6
Per Cent Freight Locomotives Unserviceable	22.8	16.2	+40.8
Average Haul Per Ton (miles)	336.6	325.4	+0.3
Average Revenue Per Ton-Mile (cents)	1.184	1.234	−4.1
Passengers Carried One Mile (thousands)	573,645	1,240,494	−53.8
Average Passenger Journey (miles)	354.2	291.6	+21.5
Average Revenue Per Passenger-Mile (cents)	2.531	2.057	−17.2

* Figures below this line are for entire Santa Fe System. Those above it do not include the Gulf, Colorado & Santa Fe.

The brunt of the depression, it will be noted, fell upon the stockholders, their dividends declining 71.5 per cent. A still further reduction, it appears, will occur this year since, while dividends on the preferred stock were paid at the full rate of 5 per cent throughout 1932, and a disbursement of one per cent was made on the common stock, the semi-annual payment on the preferred made on February 1 this year was reduced from the customary 2½ per cent to 1½ per cent—although, presumably, bet-

ter earnings in the second half of the year might permit the regular rate to be restored.

Selected operating statistics comparing the two years are given in Table II. The shrinkage in freight revenue was greater than that in net ton-miles, reflecting the decline in average revenue per ton-mile. The difficulties encountered in maintaining service to patrons when traffic is light are shown in the decline in the number of cars per train and net tons per car and per train. The improvement in train speed was marked and there was, due largely to this fact, some betterment in gross ton-miles per train-hour. That there was some decline, even though small, in coal consumption per 1000 gross ton-miles is remarkable in view of the unfavorable operating conditions which arose from light traffic.

The decline in passenger business has been almost catastrophic. In 1920 revenues from this source totaled $63,473,165, as compared with $14,520,805 in 1932—a decline of 77 per cent. In 1920 passenger revenues were 25 per cent of total revenues; in 1932 only 11 per cent. Passenger revenue (exclusive of mail and express revenue) per passenger train-mile in 1920 stood at the attractively remunerative figure of $2.45. In 1932 it declined to 76 cents, and with mail and express revenue included, the average passenger train brought in a total of only $1.21 per mile, as compared with $3.15 in 1920. The company has made great reductions in passenger train-miles—5,550,000 in the past three years alone—and has substituted rail motor cars for steam service in many places. Still, how either to build up this business or to reduce the losses it now entails, remains a perplexing problem which the Santa Fe shares with many other roads.

The principal sources of freight traffic for the Santa Fe are farms and factories—products of agriculture and manufactured goods each accounting for some 32 per cent of total tonnage in 1932. Products of mines made up but 25 per cent of total tonnage, and fuel—coal and crude petroleum—was less than a third of this total. Almost one fifth of the tonnage from mines was presented by copper ore and concentrates, and there was a similar volume of sand and gravel. Approximately half of the heavy tonnage of agricultural products was wheat. The Santa Fe normally has a heavy volume of such traffic at this time of year and the shortage of the 1933 crop in its territory accounts for the fact that the road's carloadings currently reported are running behind those of 1932, a condition which will probably not obtain after the wheat movement period has passed.

The Santa Fe, as is generally known, is one of the most conservatively capitalized of any of the large railway systems. With total assets at the end of 1932 of over one and a quarter billions, it has outstanding less than 310 millions of bonds, and approximately 367 millions in stock. The corporate surplus at the end of 1932 totaled 403 millions which, it will be noted, exceeds the par value of outstanding stock and indicates that for every $100 of stock there exists in the property an equity of more than double that amount.

The company has found its collection and delivery service for l.c.l. freight a success in meeting truck competition. However, the annual report for 1932 points out that "as long as competitive trucks are not regulated and can name whatever rate is necessary to capture the business, it is impossible to determine what traffic the railroads can expect to handle in competition with truck transportation. The need of reasonable regulation of truck transportation is so evident in the interest of the public generally and of shippers, motor carriers, and railroads, that it seems reasonable to hope it will not be much longer delayed."

Co-ordinator Eastman Seeks Salary Reductions

(*Continued from page 152*)

higher officers had had only one reduction of 10 per cent. Mr. Eastman gave no indication as to what figures he would consider reasonable or whether he desired reductions below those fixed by the R. F. C. His latest report to the Senate showed only salaries as of March 1 of $50,000 or more.

Some indications are now seen that the question as to what is a proper salary for a railroad officer may become the subject of hearings and rehearings like other questions pertaining to railroad management. J. Ledlie Hees, president and trustee of the Fonda, Johnstown & Gloversville, has petitioned the Interstate Commerce Commission for a reconsideration and redetermination as to his salary as trustee, for which the commission on June 17 prescribed a maximum of $7,500. He had previously asked the commission to fix the salary at $15,000, which he formerly received as president, although he had reduced it in 1931 to $10,800. The federal court in charge of the reorganization had fixed the amount at $10,800, after a hearing, before it received notice of the commission's action.

Employee Compensation on Different Basis

The compensation of railroad employees under the new law is on another basis. It provides that the number of employees in the service of any carrier shall not be reduced below the number on the payrolls in May, after deducting not to exceed 5 per cent for death, normal retirements or resignations, "nor shall any employee be deprived of employment such as he had during said month of May or be in a worse position with respect to his compensation" by reason of any action taken pursuant to the authority conferred by the law. Mr. Eastman has issued to the railroads General Order No. 1 directing them to file a list of all employees who actually received pay for services rendered in May together with the total compensation, the total straight time compensation, and the total overtime compensation of each, for the month. In addition statements are to be filed monthly showing for each major occupational group the number of employees and the increase or decrease as compared with May, 1933.

Advisory Committee Appointed

One result of the conference was the formation of an advisory committee to work with J. R. Turney, director of the Freight Service Section, to consider plans for handling less than carload freight and express traffic. This will consist of the three regional traffic assistants, W. L. Chandler, C. E. Hochstedler, and M. M. Caskie, who are representatives of the shippers, and J. F. Deasy, vice-president of the Pennsylvania, F. W. Robinson, vice-president of the Union Pacific, and Charles Barham, vice-president of the Nashville, Chattanooga & St. Louis.

In addition to the executives selected by the Class I railroads, the three regional co-ordinating committees will also include representatives of the short lines and the electric railways, as follows: Eastern region: H. A. Kemmerer, president of the Cornwall Railroad, and Thomas Conway, receiver of the Cincinnati & Lake Erie; Southern region, H. W. Purvis, receiver of the Georgia & Florida, and Edgar Thompson, vice-president of the Piedmont & Northern; Western region, J. F. Sheehy, president of the Chicago Short Line, and C. M. Cheney, president of the Waterloo, Cedar Falls & Northern.

Superintendents Meet at Cleveland*

Concluding reports, presented at the annual meeting of their Association, discuss faster l. c. l. service, motor competition and claim prevention

THE following three reports, on higher speed in l.c.l. service, motor competition and claims from perishable traffic, were presented at the thirty-ninth annual convention of the American Association of Railroad Superintendents at Cleveland, Ohio, on June 12-13. A story on the proceedings of the convention, including abstracts of several committee reports, was published in the *Railway Age* of June 24.

Higher Speed in L. C. L. Service

Innovations in operating practices have been initiated by numerous roads to provide faster service for l.c.l. traffic. A review of these measures and of the operating problems created thereby provided the basis for a report by a committee of which Fred Meyers, superintendent of transportation of the Wabash, St. Louis, Mo., was chairman. An abstract of this report follows:

Steel containers for l.c.l. freight are used extensively by the New York Central and the Pennsylvania. These containers are transported on railroad flat and gondola cars, motor trucks or trailers making possible the direct movement of merchandise intact without unloading from the store door of the shipper to that of the consignee. The advantages indicated in container service are a substantial saving in preparing merchandise for shipment, packing can be held to a minimum as freight reaches destination intact in the containers, and rehandling enroute is eliminated. There is also a saving in loss and damage claims due to merchandise being handled only at the door of the consignee and that of the shipper. Different articles may be included in the shipment and tariff charges on such shipments are liberal —this in order to meet the necessities of manufacturers having various lines of production.

The Pennsylvania has in service more than 3,000 all-steel containers. Its container service generally centers on two container transfers (points where containers are shifted from car to car), the larger operation being at Harrisburg, Pa., with another at South Kearney, N. J. Containers from and to some 16 stations in Philadelphia, 9 stations in New York and Brooklyn; Camden, N. J., Trenton, Jersey City, Newark and Harrison; Baltimore, Md.; Harrisburg, Pa., Lancaster and York, and 21 larger stations to the north and west of Harrisburg, including Chicago, East St. Louis, Ill., Detroit, Mich., and Buffalo, N. Y., are transferred at Harrisburg transfer; the total operation eastbound and westbound at that point daily involves the handling of about 850 containers. At South Kearney, N. J., containers between stations in New York, Brooklyn and vicinity and stations in Philadelphia, Camden, N. J., Wilmington, Del., Baltimore, Md., Washington, D. C., Potomac Transfer, Va., and Schuylkill Division points are transferred, the number of containers handled daily at that point being between 200 and 300.

Container-Trailer Service

The Chicago, North Shore & Milwaukee uses a fleet of motor trucks with trailers in what is known as "ferry truck service." Trailers are delivered to the door of the shipper, who loads and seals them. The dispatcher is then notified, and he sends a tractor to pick up the trailer and set it on a specially-constructed flat car capable of holding three trailers. The tractor is withdrawn after loading the trailer. On arrival at destination, a tractor is coupled to the trailer and it is taken directly to the door of the consignee, who breaks the seal and unloads the trailer.

This service corresponds to the trap-car service of railroads, and it results in a great saving in operating cost to the railroad by reason of the fact that the shipment is not transferred into a freight car, eliminating two handling operations, those of loading and unloading the shipment. In addition, the possibility of pilferage and loss is reduced to a minimum, and since the trailers are of all-steel construction and watertight, the possibility of damage by weather conditions is negligible. The advantages to the shipper and consignee are that all cartage charges are eliminated and four handling operations are made unnecessary. Moreover, it is not necessary to mark each carton or individual piece, for the shipper knows that whatever he loads into the trailer will be delivered intact to the consignee.

In addition to this "ferry service," the North Shore has 18 off-track freight stations in Chicago where package freight is received or delivered to shippers. The same trailers that are used in the "ferry service" are loaded with package freight at these various stations. When the trailers are loaded, the dispatcher is notified and a tractor then delivers the trailer to the railroad where the package freight is sorted and loaded into a package rail car.

The Chicago, South Shore & South Bend is using a "truck" service similar to that used by the North Shore, except that the movement of all trailers to and from stations and shippers is done by contract with a trucking concern. From 400 to 500 ferry truck loads per month move to and from the Chicago stations of the two roads.

Somewhat similar to the method of these electric lines is a demountable truck body service inaugurated by an eastern line, under which the truckers continue their present operations in the metropolitan areas while the railroad is concerned only with the intercity or line haul movement. This service provides a close working relationship between the trucker and the railroad; relieves the trucker of the terminal-to-terminal transportation, including the worry over unfavorable weather conditions, congested highways and constantly changing highway regulations; effects economies, as the cost by rail between terminals is cheaper than by truck over the highway; offers a simplified plan for the determination of transportation costs, as rates are assessed according to the length of the truck body, and all traffic, except a few commodities of a dangerous nature and other unfavorable characteristics, is accepted in straight or mixed truck body loads; and affords a fast, regular and dependable service. This demountable truck body service is available between Baltimore, Md., and Richmond, Va., Jersey City, N. J., Philadelphia, Pa., and Jersey City.

Free pick-up and delivery service has been established by all southwestern lines on l.c.l. shipments moving a distance of approximately 300 miles or less. The pick-up and delivery service on shipments from and to points beyond the pick-up and delivery zone is available to consignees at an added charge of 10 cents per 100 lb.

As a means of meeting motor truck competition, the operation of high-speed merchandise freight trains, co-ordinated with motor truck service, to provide overnight deliveries from storedoor to storedoor between distant points, was adopted by one of the southwestern lines, where the "Blue Streak", widely advertised as "the fastest freight train in America", connects St. Louis, Mo., with Memphis, Tenn., Little Rock, Ark., Texarkana, Tex., and Shreveport, La., with overnight service. The "Blue Streak", in order to maintain its scheduled overall speed of approximately 40 miles per hour, is unable to stop at more than a few points. Motor truck schedules co-ordinated with the train schedule, however, extend the fast service offered by the train to local points along the main and branch lines.

Other southwestern lines have speeded up the movement of their l.c.l. shipments between all important stations in the southwestern territory. In some instances the railways provide the through transportation service from storedoor to storedoor, by contracting with local trucking companies for pick-up and delivery service, and issue their own bills of lading covering the complete movement. On one of the southern lines, a transport company was organized for the purpose of rendering a co-ordinated or storedoor delivery service on intrastate shipments in Texas, the entire stock of the transport company being owned by the railroad. Initial operations were started on August 1, 1930, and through the efforts of an interested corps of solicitors and employees, considerable progress has been made in recapturing traffic from motor carriers.

*Part II of a two-part report of the convention of the American Association of Railroad Superintendents at Cleveland, Ohio. Part I was published in the *Railway Age* of June 24.

Efforts have been renewed to encourage l.c.l. traffic, and many methods have been devised and adopted to modernize the handling of l.c.l. freight, including such items as the following:

(1) The use of a manifold form of waybill avoids the necessity of expensing shipments on arrival at destination. As delivery is made immediately on arrival of shipments, this obviates the furnishing of notices to consignees.

(2) Package car schedules have been revised to provide set-out cars at the important towns; where the traffic is insufficient, either actual or potential, to justify this service, l.c.l. merchandise for several stations is loaded in one merchandise car and worked back on a peddler or local train, so as to effect early morning delivery.

(3) To a large extent, minimum tonnage requirements are waived where set-out package cars are operated.

(4) Station forces are rearranged to provide for early morning unloading and checking to delivery trucks of l.c.l. freight, and likewise for the late afternoon receipt of outbound shipments.

(5) Routes on interline l.c.l. shipments have been revised to conform to the expeditious schedules available, with less consideration for the application of divisions.

(6) Motor trucks, tractors and trailers in a number of the principal cities have replaced the trap car and speeded up the handling of l.c.l. freight service by 24 hr. or more, in addition to effecting operating economies. However, trap car deliveries are continued at some of the larger stations, although the use of motor trucks in lieu thereof is being extended.

(7) Package car loading schedules have been revised and transfer stations rearranged to expedite final delivery of shipments.

Some of the above changes have enabled the establishment of overnight delivery of l.c.l. freight from important shipping centers to principal outlying cities and towns within a radius of approximately 300 miles. Some lines have established a mixed service between several of the terminals to effect early morning delivery. First-class box cars with steel wheels, steam heat and communicating signal lines were prepared, so that passenger equipment can be handled on the rear of the train. These mixed trains are operated on fast over-night schedules, affording early next morning delivery at points 300 miles distant.

Storedoor pick-up and delivery is generally recognized as a part of freight transportation, and we believe that it will ultimately be adopted all over the country, not alone for l.c.l. traffic but possibly for carload traffic as well, in order to meet highway competition.

Discussion

J. W. Skaggs (Frisco) described the initial difficulties that arose when his road installed pick-up and delivery service out of Kansas City, but stated that these difficulties have now largely been overcome and traffic is being brought back to the rails. In connection with the installation of this service, his road put into effect later closing schedules at freight houses and tightened up running time on the road. The problem confronting most roads, as he sees it, is not that of installing container or other services referred to in the committee's report, but of ascertaining what can be done by each road with equipment which it already has. Mr. Skaggs also stated that one of the difficulties confronting the roads is the classification requirements, to which trucks pay little or no attention. To meet this situation, George Brophy (Un. Pac.) advocated an all-commodity rate for carload shipments, applicable to all commodities other than those that contaminate other lading. He stated that such a rate has already been put in service between certain points on the western lines. In discussing arrangements with contract truckers, L. G. Waldrop (L. & N.) stated that his road established a fixed rate which it paid any recognized trucker for pick-up and delivery service, with the result that many of these truck lines started to solicit business on their own initiative for rail movement.

Motor Competition

For several years the association has been endeavoring to keep abreast of the development of the newer transportation agencies, through the presentation of reports outlining developments during the year. In accordance with this practice, a report was presented at this convention by a committee headed by M. F. Steinberger, manager, highway transportation, B. & O., Baltimore, Md. The following is an abstract of this report which, in common with the other reports presented at this convention, was prepared a year ago.

Because of the depression, motor bus companies have in general been curtailing their services rather than expanding them. There have been some consolidations of smaller companies into co-ordinated operations, either through actual consolidations or through traffic agreements. Few bus companies report any net earnings, but such statistics as we have seen indicate that, so far as the larger, well-operated companies are concerned, their losses because of present conditions have not been relatively as great as those of other transportation systems.

Generally speaking, there have not been so many "fly-by-night" operations functioning, and the indications are that there has been a general stabilization in the industry. However, there still remains a lack of uniformity in the rate structure so far as motor coach operations are concerned, and it is this lack which still keeps the rates so low as to present a serious competitive feature to the railroads. It is our opinion that the prime consideration which prompts the continued patronage of motor bus lines is low fares.

In our reports of the past few years, we have emphasized the desirability of both national and state regulation of motor buses. While Congress has as yet taken no final action on the bills before it, numbers of state legislatures have taken action which will in time bring a more uniform and regulated scheme of operations. With respect to taxes, it is still our contention that proper adjustments must be made in order that vehicles using the highways for commercial purposes will pay for such use on a basis commensurate with that use.

So far as competition is concerned, some progress has been made by the railroads through improvements in service, air-conditioning of equipment and the wider use of excursions and reduced fares. It is the contention of numerous railroad officers that rail fares should be reduced to a point where they will approximate the rates charged by responsible bus operators and that when that is done, the situation will change.

Motor Trucks

The motor truck is becoming an increasingly serious competitor of the railroads. Decreasing prices of equipment, lack of need for parts of fleets in terminal service, the buying of merchants' stocks in smaller lots, the number of men who have lost their regular employment and have invested part of their savings in trucks, when coupled with their inexperience and the propensity of so many business men to bid against one another, all lead to the chaotic situation which exists today. There is no stability in rates of service as between trucking companies themselves, and consequently no stability in competition between them and the railroads.

Reasons for the use of trucks generally include the following: Lower rates; lessened packing requirements; store-door delivery; ability of shipper to deal with only one agency; simplification of freight charges, collections and loss and damage procedure; simplication of rate structure, if any; ability to ship later in the evening; ability to buy or ship in small quantities at lower shipping charges; expedited service in most ranges up to overnight service.

"What should be done about it?" The answer to that question falls into two major sub-divisions as follows: (a) Legislative action, and (b) railroad practices.

Under the first heading, the following appear to be desirable, if equality of opportunity between road and rail is to be realized.

1. Certificate of convenience and necessity should be required for all common carrier, contract carrier and private truckers operating in the nature of contract carriers.
2. Bond and insurance should be required.
3. Uniform rates as between truckers should apply between any two points. This does not mean that these rates should be the same as rail rates, but that all truck rates for the same service between the same two points should be equal.
4. Proper and uniform accounts and reports to commissions.
5. Regulation of the length, width, height and load limits of vehicles or trains of vehicles, adequately policed and enforced.
6. Regulations of hours of service for employees, and safety requirements.
7. An equitable charge for the use of the highways, over and above the charges necessary to meet the normal tax obligations of all citizens. Truck lines should pay, as do other citizens, for schools, jails, fire departments, water supply, judiciary, etc., and in addition a rental charge for use of the highway.
8. Rules covering the transfer of certificates so that a right to operate over a public highway given free by the state cannot be unduly capitalized.

9. Physical examination of drivers before licensing, covering general health, sight, hearing, color, sense, etc.

10. Drivers to be 21 years of age and pass rigid driving tests.

11. The maintenance by the state of adequate police to enforce regulations properly, the cost of which should be borne by commercial interests using highways.

It is, of course, self evident that these measures will not come about over night, but an aroused public opinion will bring such legislation to fruition in a reasonable time.

It is clear that changes in railroad practices are necessary if they are to meet the competition. It is becoming increasingly evident that store-door collection and delivery, so-called, must be given by the railroads. Numerous schemes have been or are being tried out. Generally speaking, the objective is that the railroads shall give a service equally as expeditious as trucking companies at rates comparable therewith and including store-door delivery. This undoubtedly means that the freight stations should receive freight later in the day than is now generally the practice, that zone freight trains running at speeds approximating those of passenger trains should be run in the competitive distances involving over-night service, that the rate structure as well as packing requirements should be simplified, and that where economically justified, trucks should be operated over the highways.

Claims from Perishable Traffic

Recognizing that the manner in which trains are handled may influence materially the number and size of the claims filed, especially those chargeable to delay and rough handling, the superintendents' association has endeavored to work with the Freight Claim Division, A.R.A., in the control of this expense. In keeping with this policy, a report was presented this year on the handling of perishable traffic from a claims standpoint, by a committee of which C. B. Pratt, superintendent, C. R. I. & P., Herington, Kan., was chairman. This report follows in part:

Claim payments on fresh fruits, melons, and vegetables are greater than on any other commodity, representing, in 1930, 32.5 per cent of the total claim payments on all commodities. It must be recognized that perishable traffic is more highly competitive than ever before, and fruit and produce men, as well as the packers, are not unmindful of this situation. They are in a position to demand of the railroad which they favor with their traffic a record of perfect movement and accessorial service. Perfect service includes icing, ventilating and heating, as per shipper's instructions on bill-of-lading; the proper notification of arrival, bearing in mind that the maintenance of records of the service accorded to perishable freight shipments is of importance equal to that of the actual performance of the service, from a claims standpoint.

While 16 causes of loss and damage are involved in payments for fresh fruits, melons and vegetables, claim prevention efforts may well be concentrated on the three major causes; delay, rough handling, and improper refrigeration and ventilation, all transportation failures.

Delay

National Protective Tariff No. 5 and the amendments include the regulations necessary for the handling of perishable commodities, and all employees must necessarily have a working knowledge of the requirements of that tariff in order to handle perishable freight successfully. To prevent liability for delays, it is necessary that constant supervision be given cars set out for repairs. Cars delayed at hold points for diversion should be reported promptly for disposition, and when diversion instructions are received the cars should be moved in the first available train. It has been observed that diversions are sometimes offered after scheduled trains have departed, resulting in delays up to 12 hours. The time the diversion is received and the time that it is transmitted and received at the hold point are matters of first importance in claim defense.

At junction points the principal difficulty arises from a lack of proper understanding between carriers as to the cut-off time for interchanging cars to depart on certain trains. It is highly important that the operating departments have a definite agreement and that yard forces be fully conversant with the details thereof, so that there will be no failure to interchange cars in sufficient time to make the connection. If the deliveries are coming late, someone higher in authority than an interchange clerk should pass upon whether the train should be held.

Failure to make connecting trains at interchange points is not infrequently due to the technicalities of inspection, the interchange inspector "bad-ordering" a car and making it impossible to place it on the repair track and get it in a train due to go forward in a few minutes, notwithstanding the character of the commodity and the fact that many cars in the train would be found going forward equally defective if critical inspection were given. It is not urged that cars that require essential repairs should be put in a train, but it is not proper to bad-order a car for rim cracks of wheels that can be duplicated in dozens of cars moving forward on the train scheduled to handle the perishable freight. The education of mechanical department employees along these lines is of equal importance with methods of handling from the interchange track to the train.

At final terminals, delivery to team tracks, produce tracks, etc., should be watched closely and placements made promptly, especially in the early morning hours when market fluctuations occur and delay in placing a car results in a heavy claim on account of a declining market.

One of the most perplexing problems that confronts a railroad is the unscrupulous shipper who misrepresents the quality of his product, and the consignee, who because of a flooded market or drop in price, and often for no good reason at all except to bring the price down, refuses a shipment until the shipper agrees to his terms. In many cases competent men are not provided to judge the true condition of products because of their lack of knowledge of the various diseases and insect damage to these commodities; consequently, dependence is placed largely on what the consignee has to say as to this condition. Something may be accomplished by providing employees with pamphlets illustrating the various causes of damage to fruit and vegetables so that agents and others may become more familiar with them.

In considering the item of delay, special attention is directed to the necessity of clear-cut definite schedules showing the time at which various trains should arrive at terminals. We refer especially to perishables like California fruits and vegetables moving in train lots. To handle such traffic successfully, every train should have a definite symbol and a definite schedule, showing its arrival and passing time at each terminal from point of origin to destination. With the handling so planned, there is no reason why late schedules and consequent claims should not disappear.

Rough Handling

Considerable attention has been given to the question of rough handling, and yet the same progress has not been attained as with delay. Work is being carried on in the principal centers by "rough-handling committees," with an idea of interesting and educating employees, to the end that the rough handling of cars may be avoided. Such activities should be encouraged, however, the primary difficulty cannot be solved on the assumption of rough handling. The character of the package and the loading are also subject to improvement. Instances have been known where a broken package was nothing more than a cracked end board. The entire box was not damaged, but on the assumption that a claim would be allowed, such packages have been repaired, repacked and sold ostensibly at reduced prices, whereas as a matter of fact, there was no damage whatever to the contents. Extensive supervision would develop where such practices are prevalent and corrective measures should be taken to stop the irregularity.

Claims resulting from rough handling or unlocated damage provide one of the heaviest items of expense. Every operating officer should understand that freight claims are chargeable as much against his division or district, as the running of a train or the operation of a switch engine. Trainmasters, yardmasters, etc., should never overlook an opportunity to bring this to the attention of those who are actually handling this traffic and impress them with the necessity of careful handling.

Refrigeration and Ventilation

This item is a prolific cause of claims. The tariff permits many classes of instructions and endless diversions. The inspection of nearly any waybill covering the movement of a car of perishable freight for any distance will show so many changes that it is difficult for the ordinary clerk or trainman to tell just what the proper handling is. Much of the confusion is caused by the person making the changes not putting them in the proper place or canceling previous instructions when making the changes. A strict rule should be applied that, when changes are made by diversion or change of instructions for ventilating, they should be placed chronologically on the waybill, and all former instructions erased or scratched to avoid confusion. The waybill is the only proper authority for the movement of any car and the car should follow exactly the routing and instructions shown on the waybill, unless the waybill is corrected.

Diversions, a necessary privilege for the proper distribution of commodities, are subject to serious abuse if not properly followed up. Employees at principal diversion points are usually so well educated regarding the requirements as to insure diversions

(Continued on page 164)

Motor Transport Section

Analyze Results of Pick-Up and Delivery Service

Boston & Maine finds it has prevented further spread of trucking zone and returned some business to the railroad

AFTER a year of experimentation with the provision of pick-up and delivery service for l.c.l. freight, and an exhaustive analysis of what the service has achieved, the Boston & Maine has concluded that this additional inducement to shipping by rail has accomplished what was intended, in that it has prevented a further spread of truck competition in Boston & Maine territory and has brought about the return of some business to the railroad. While the increase in revenue on freight picked up and delivered was comparatively small during the year's operations, this was not entirely due to the trucking expense incident to the pickup and delivery service but was due in part to reductions in rates which the railway made during the year to meet the rates of competitive truck lines.

It is the conclusion of the Boston & Maine that door-to-door service furnished by highway transportation makes it necessary for the railroads to give similar service if they wish to continue to haul merchandise traffic. Realizing that one year does not afford sufficient time in which to cure the damage caused by the failure of the railways earlier to meet truck competition, since many shippers have not been willing or able to break their contracts with highway truckmen or to sell their own trucks, and are not anxious to return to railroad transportation until the railways indicate that they will provide as good rates and service as their competitors, the Boston & Maine will continue to render pick-up and delivery service on l.c.l. freight, and feels that it should be adopted throughout Official Classification territory.

Beginning of the B. & M. Experiment

Having watched its short-haul merchandise traffic being steadily diverted to highway transportation, and taking into consideration the continual widening of the zone of truck competition, the Boston & Maine determined to try pick-up and delivery service on l.c.l. freight, first, to prevent further extension of the trucking zone and, second, to win back some of the tonnage which had been lost. After officers of the railway had discussed the matter thoroughly with other carriers in New England, the pick-up and delivery service was put into effect on May 16, 1932. At the outset, 57 of the larger stations located on the Boston & Maine were selected as pick-up and delivery points, but the service was soon extended to 324 stations on Boston & Maine and connecting lines in Northern New England.

In analyzing the results of the railway's experiment, J. R. MacAnanny, assistant freight traffic manager, investigated the situation from every angle. His findings, upon which this article is based, represent the considered conclusions of the man who has been in charge of this service on the Boston & Maine from the start.

Where Service Should Be Rendered

As mentioned before, the number of points at which the pick-up and delivery service was offered was increased during the year to 324. It was found, however, that the arrangement was not productive of increased tonnage at some of the smaller stations and these are being eliminated from the tariff. The conclusion is that pick-up and delivery points should be restricted to the larger cities and towns, except where unusual circumstances warrant otherwise.

The pick-up and delivery service was confined, at each point, to the corporate limits of the city, town or village within which the railroad station was located. The railway endeavored to use the Railway Express Agency territorial limits by referring to the agency's tariff, I. C. C. No. A-4, but the Interstate Commerce Commission objected to this and advised that it would be necessary for the railway to carry this information in a freight tariff. There is little difference between Railway Express Agency limits and city or town limits at the larger points, and, as the public more readily understands the latter description, the conclusion is that this should continue to be used.

Requests for Service

In order that all of its station-to-station business should not be diverted to pick-up and delivery service until the contracting truckmen were in a position to handle it satisfactorily, and to avoid delivery complications at destination because the service was not universal, the Boston & Maine insisted that the shipper endorse on the bill of lading covering each shipment whether or not the pick-up and/or delivery service was desired. It was the experience of the railway that numerous shippers neglected to indicate on the bill of lading that delivery service was desired at destination. On the other hand, some shippers were over-zealous and requested delivery service on everything, which proved unsatisfactory to consignees who had contracts with local truckmen and did not wish the railroad truckmen to take the business away from them. Since two-thirds of the railway's merchandise traffic moving between pick-up and delivery points is now accorded pick-up and/or delivery service, and as it is thought that the service will sooner or later become universal, the conclusion is that, in addition to the present bill of lading instructions, the railway should

also accept standing orders for delivery service from consignees at destination.

Rates for Storedoor Service

In the beginning, it was the judgment of the Boston & Maine traffic department that a reasonable highway trucking distance was 150 miles. Consequently, this was set as the maximum distance at which the railway would furnish free pick-up and delivery service, subject to a minimum rate of 25 cents per 100 lb. and a minimum charge of $1. For pick-up and delivery service on freight moving between 150 and 200 miles, 5 cents was added to each class rate, and the additional charge was 10 cents for pick-up and delivery of freight moving over 200 miles. It was found that the 5 and 10-cent additions and the $1 minimum charge were obnoxious to certain shippers, who refused to give the railway any of their business unless the B. & M. took it all and declined to give the railway all of the business unless it removed the disturbing additions to the rates and also the minimum charge. Because of this pressure, the Boston & Maine did so.

The removal of the 5 and 10-cent additions to the class rates had more of a psychological than a revenue effect, because during the year many commodity rates were issued between all the important points on numerous commodities, such as groceries and grocery supplies, drugs and drugstore supplies, paint and paint materials, etc. As soon as the railway discovered some substantial amount of traffic moving via the highway, it went after it with a commodity rate and generally secured the business, not alone because of the reduced rate but through the combination of the reduced rate plus railroad responsibility and the pick-up and delivery service.

The conclusions concerning the rates for the pick-up and delivery service are that, while any distance selected for free pick-up and delivery may not cover all trucking situations, and the additions to the class rates mean little on the shorter hauls (because of the publication of commodity rates), the station-to-station class rate should include pick-up and delivery service up to and including 260 miles, with a minimum class rate of 25 cents and a minimum charge in accordance with the Official Classification. The suggestion is also made that 2 cents should be added to each class rate for each additional block of 20 miles beyond 260 miles until a total of 12 cents has been added, that figure to be the maximum addition. Under this plan, the rates would commence to cover pick-up and delivery expense at 380 miles. It is realized that it might be necessary to go beyond the 12-cent addition if the pick-up and delivery service should be extended to such large centers as New York and Chicago.

Truck Operations under Contract

The truck service in connection with the pick-up and delivery has been handled by the Boston & Maine through contracts with local truckmen, with satisfactory results. The local truckmen engaged by the railway have become solicitors for the freight service. The railway convinced them that they were fellow sufferers from highway transportation and that the highway truckmen, in taking the line haul away from the railroad, generally took the pick-up and delivery service from the local truckmen.

Truck service was generally secured from the contractors on the basis of a payment of 5 cents per 100 lb., on a minimum of 100 lb., but in a few instances it was necessary for the railway to pay a slightly higher figure. Originally, the Boston & Maine paid its contract truckmen a minimum of 25 cents per shipment, but this had to be dropped when the $1 minimum charge was eliminated from the tariff. The truckmen have protected the railroad from any loss or damage sustained by shipments while in transit between the shipper's place of business and the railway station by putting up bonds ranging in amount from $500 to $5,000. During the year, the claims were negligible.

Except in a few instances, the railway engaged only one truckman at each point. Where more than one was hired, difficulties were encountered, each truckman wanting the other to handle the light-loading and long-trucking-distance freight. The railroad also found that it could give better service through one truckman and make better contracts with one truckman than it could if the business were split between two or more contractors. The conclusion is that the use of local truckmen should be continued, with the restriction of contracts so far as possible to one truckman at each point.

Divisions

Originally, it was agreed among the New England lines participating in the pick-up and delivery service that they would deduct the trucking expense from the freight revenue before pro-rating, and add the trucking expense to the division of the originating or destination carrier. Subsequently, it was discovered that this was not the proper method, since the trucking charge is an operating expense like switching expense. Each carrier, therefore, agreed to take care of its own terminal expenses. The conclusion is that each carrier should continue to make its own trucking arrangements and to take care of its own terminal expenses.

Allowances and C. O. D. Shipments

The Boston & Maine has refrained from granting allowances to shippers who truck their own freight to and from the freight station, for two reasons: (1) Because it would invite solicitation abuse; and (2) it would probably force the establishment of pick-up and delivery service at all points in order to avoid complaints of discrimination from the shippers at intermediate points who would not be eligible for trucking allowances. Under the present plan of applying a through rate from door via the contract truckmen, the railway has avoided this difficulty, the Interstate Commerce Commission having decided that it would not be necessary to establish the door-to-door service at the intermediate points, although the commission did say that the railway must not exceed the door-to-door rates for station-to-station service at the intermediate points. This latter feature developed when the railway published commodity rates, and appropriate intermediate application rules are now carried in the commodity tariff.

While admitting that the point is debatable, it is the view of Mr. MacAnanny that, to facilitate the handling of freight at the freighthouse, it would be better to have the shipments arrive in the contract trucks, in full truckload lots, rather than in shippers' trucks in small lots. Making allowances to shippers would tend to send many small lots of freight to the station in shippers' trucks, and naturally this would require more tailboard space at the freighthouse than would be necessary if one truckman handled all the business and consolidated it into truckloads, bringing it to the station at regular intervals. The conclusion is that the railway should continue to decline to make allowances to shippers who truck their own freight to and from the station. During the year's experiment, there was no great demand for this.

The railway has refrained from accepting C.O.D. shipments, believing that this feature could best be taken

care of by the order-notify bill of lading, and the conclusion is that this arrangement should be continued.

Generally speaking, contract truckmen deliver the inbound freight to consignees before noon and use the same trucks to pick up outbound shipments after the middle of the day. A great many of the shipments are picked up in the late afternoon, and, as a result, some of these cannot be forwarded on the same night, owing to the late arrivals of the trucks at the freighthouses and the early departure of trains. The railway finds that it is still losing substantial tonnage to the highway truckmen because they will pick up the freight late in the afternoon and forward it the same night, while the railway cannot do so in all cases. The conclusion is that the operating department of the Boston & Maine should give serious consideration to the establishment of later departures for freight trains or to the handling of merchandise traffic in passenger or combination trains, to permit the later pick-up of freight which would still move forward the same night.

During the year of experiment with pick-up and delivery service, the railroad's soliciting organization was not assigned to the cultivation of this l.c.l. merchandise traffic, it being felt that their time could be spent more advantageously in soliciting carload freight and that the local agents and truckmen could handle solicitation of merchandise traffic more efficiently on account of their familiarity with local conditions. Also, the railway refrained from spending any money in advertising the pick-up and delivery service, feeling that it was an experiment and that it would not be advisable at the moment to attract attention to the service among shippers in other parts of New England where the pick-up and delivery was not established. The conclusion is that the past solicitation practice should be continued, but that the pick-up and delivery service should now be advertised in a reasonable way.

Results in Tonnage and Revenue

The pick-up and delivery service on the Boston & Maine started on May 16, 1932. At Boston, Mass., forwarded business (including station-to-station freight) for the week ending May 13, 1933, was approximately 1,000,000 lb. greater than for the same week in 1932, or an increase of 39 per cent. The revenue on this freight represented an increase of 27 per cent, the smaller increase compared with the tonnage increase being due to the publication of commodity rates during the year. If the trucking expense is deducted, the revenue increase is further reduced to 10 per cent. A similar comparison of the forwarded business from all pick-up points, including Boston, shows an increase of approximately 2,000,000 lb., or 45 per cent. The revenue increased 24 per cent, or, if the cost of trucking is deducted, 9 per cent.

At Boston, 60 per cent of all the l.c.l. business moving to pick-up and delivery points is now being handled in the pick-up and delivery service, 40 per cent of it still remaining in straight station-to-station service. L.c.l. freight forwarded from Boston to pick-up and delivery points during the month of May, 1933, constituted 28.5 per cent of all the l.c.l. traffic handled through the freighthouse during that period. The average rate per 100 lb. paid by the shippers on the Boston pick-up and delivery freight was 45 cents, while the average weight of the shipments was 400 lb.

In connection with the Boston tonnage, 15 per cent of the aggregate was forwarded to 10 of the larger stations, all located in Northern New England, representing only 3 per cent of all the pick-up and delivery points. Of these 10 stations, 7 were located in Maine, 2 in Vermont and 1 in New Hampshire. About 75 per cent of all the l.c.l. freight handled through the Boston freighthouse is consigned to points in New England, the other 25 per cent going to points north, south and west of New England.

During the month of April, 1933, the Boston & Maine handled at all points 38,564 pick-up and delivery shipments, weighing 16,702,242 lb., on which the freight charges were $80,398.40. The trucking cost on the local business was approximately $5,500, or 20 per cent of the freight revenue. The average rate earned on this local business was 40 cents per 100 lb., or, if the cost of trucking is deducted, 32 cents per 100 lb. The trucking cost on the entire pick-up and delivery traffic, including local and joint traffic, was about $9,900, or 18 per cent of the revenue. The Boston & Maine's average earnings (rates and divisions) were 33 cents per 100 lb., or, if the cost of trucking is deducted, 27 cents per 100 lb.

Heavy Volume of Trucked Freight Shown

THE volume in which freight is moving by motor truck over the highways between New York and Philadelphia, Pa., is extremely heavy, as shown by a check recently made. The checking point was located at Metuchen, N. J., where the concentration of traffic between New York and Philadelphia is probably the greatest, on account of the three or four routes feeding into Super-Highway No. 25 south of that point. The check was made on all trucks moving over the Super-Highway at Metuchen between 5 p.m. on June 27 and 5 a.m. on June 28.

During this 12-hr. period, a total of 1,402 motor trucks passed the checking point, with the movement fairly equally divided as between northbound and southbound trucks. A total of 749 northbound trucks were checked, while the total of southbound trucks was 653. General freight constituted the lading of 821 of the truck units, while the next heaviest item of traffic was produce. Other commodities moving by truck, as disclosed in the traffic check, and the volume of the movement, are shown in the tabulation below:

Summary of Traffic Check—June 27-28, 1933

Lading	Northbound	Southbound	Total
General Freight	399 units	422 units	821 units
Produce	255 units	6 units	261 units
Poultry	14 units	...	14 units
Milk (tank units)	17 units	5 units	22 units
Gasoline (tank units)	12 units	7 units	19 units
Furniture Vans	5 units	11 units	16 units
Refrigerated Trucks	1 units	5 units	6 units
Auto Carriers	9 units (Mty.)	6 units (Loaded)	15 units
Empty Trucks	37 units	191 units	228 units
Total	749 units	653 units	1,402 units

The capacities of the loaded trucks checked were estimated as follows: Up to 5 tons, 334; 5 to 10 tons, 444; 10 to 15 tons, 268; 15 to 20 tons, 36. Of the types of equipment noted among the loaded trucks, the two-axle, four-wheel truck predominated. There were 685 of these out of the total of 1,082 loaded trucks. Of the other types, there were 92 of the three-axle, six-wheel trucks, 249 tractor and semi-trailer combinations, 50 truck and full-trailer combinations, and 6 auto carriers.

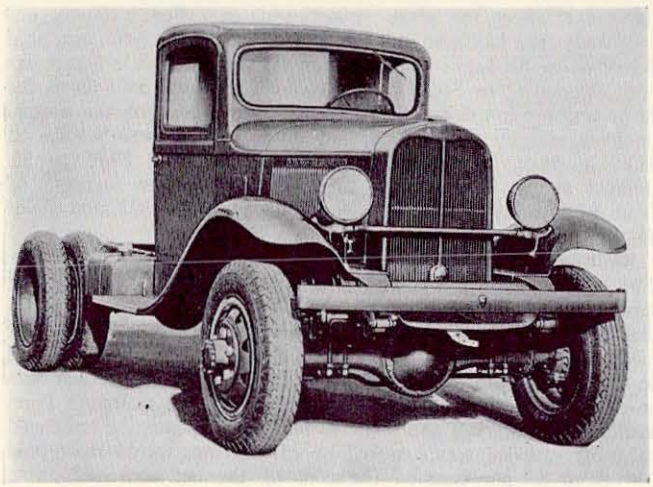
A conservative estimate of the amount of freight handled on the loaded trucks, which passed the checking point during the 12-hr. period, is approximately 8,000 tons. Comparing the movement on the nights of June 27-28 with the movement during the time of a similar check made in April, 1932, merchandise tonnage currently being handled is 19 per cent greater than that moving at the time of the previous check. The increase

in produce handled was 335 per cent largely for seasonal reasons.

Allowing for the seasonal changes in the movement of produce, it is estimated that the annual tonnage of freight moving by truck over this one highway between New York and Philadelphia is in excess of 2,000,000 tons. On the basis of a revenue of $3 per ton, the annual revenue from the freight trucked over this highway would be in excess of $6,000,000.

All-Wheel-Drive in Marmon-Herrington Trucks

A COMPLETE new line of four- and six-wheel-drive motor trucks, consisting of 21 models with capacities of 1½ to 20 tons, has been placed on the market by the Marmon-Herrington Company, Indianapolis, Ind. The new line is divided into four



Model A10-4, the Smallest of the New Marmon-Herrington All-Wheel-Drive Trucks

series of trucks and each vehicle is offered in two or three wheelbase lengths, with the result that 48 different types of equipment are available.

The five smaller four-wheel-drive models are grouped in the new A series, with capacities of 1½ tons, 2½ tons, 3½ tons and 4 tons. The next larger group, known as the TH-4 series, comprises six four-wheel-drive models, with capacities ranging from 4½ to 9 tons. The next series, TH-6, consists of five six-wheel-drive models, with capacities of from 10 to 20 tons, while the fourth group is the THD series, consisting of six models, all powered with Diesel engines. Three of these are four-wheel-drive units and the others are six-wheel-drive models, and the capacities range from 7 to 20 tons. All 21 of the new models have certain features in common, including the front axle design, auxiliary transmissions to supplement the standard transmissions, and heavy-duty, six-cylinder engines with seven-bearing crankshafts.

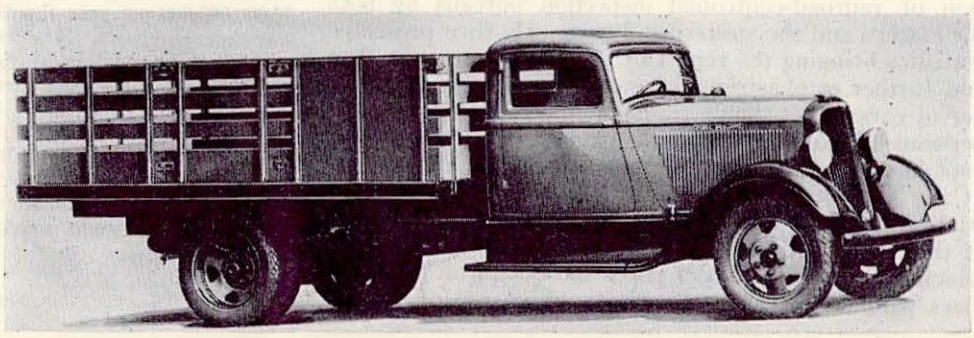
The smallest model, A10-4, is offered in wheelbases of 135 in., 143 in. and 155 in. With standard and auxiliary transmissions, there are eight forward speeds and two reverse speeds. The 85-hp. engine has a torque of 155 ft.-lb. Internal-expanding, four-wheel hydraulic brakes and the Ross cam and lever steering system are employed. Model A20-4, with a capacity of 2½ tons, is available in wheelbase lengths of 135 in., 143 in. and 155 in. The engine develops 105 hp. and has a torque of 193 ft.-lb. The standard and auxiliary transmissions give 10 forward speeds and 2 reverse speeds. Model A30-4, with a capacity of 3½ tons, is available in wheelbase lengths of 155 in. and 167 in., the engine developing 94 hp. and a torque of 235 ft.-lb. Model A40-4, in wheelbases of 155 in. and 167 in., is rated at 4 tons. The engine develops 107 brake hp., with 265 ft.-lb. torque. Model A50-4, likewise rated at 4 tons, is offered in longer wheelbases—158 in. and 175 in. Among its features are Westinghouse air brakes with a 6-cu. ft. air compressor and 9-in. axle diaphragms. Like Model A20-4, the three larger models in the A series have standard and auxiliary transmissions providing 10 forward speeds and 2 reverse speeds.

Outstanding features of the new TH-4 series and TH-6 series are Westinghouse air brakes, standard and auxiliary transmissions and engines with horsepower ratings as high as 180 hp., developing a torque of 550 ft.-lb. The specifications of the six Diesel-engined models in the THD series are the same as those of the corresponding gasoline-engined models, with the exception of the necessary installation changes.

New 1½-Ton Motor Trucks Offered by Dodge Brothers

THE Dodge Brothers Corporation, Detroit, Mich., has developed a new series of 1½-ton trucks available in two wheelbases—131 in. and 157 in. The six-cylinder engine with which these trucks are powered has a bore of 3⅛ in. and a stroke of 4⅜ in., delivering 62 brake hp. at 3,000 r. p. m. The transmission, which is in unit with the power plant, provides four speeds forward and one in reverse. Engine cooling is by a centrifugal pump, the radiator being of the cellular type and the cooling system having a water capacity of 3¼ gal.

The chassis frames are of hot-rolled steel, the frame members on the 131-in. chassis measuring $6\frac{29}{32}$ in. deep, with a $2\frac{5}{16}$ in. flange, and $1\frac{1}{64}$ in. thick. On the 157-in. chassis, the frame dimensions are: Depth,



The New 1½-Ton Dodge Truck with 11-ft. Stake Body

7 1/32 in.; flange width, 2 3/8 in.; and thickness, 15/64 in.

The rear axles in both chassis are full-floating, enclosed in a cast-steel housing, with heat-treated steel tubes electrically welded to the steel housing. The spiral-bevel-drive gears are nickel-chrome-vanadium steel, while the axle shafts are of chrome-nickel alloy steel. The standard gear ratio is 5.857:1, giving a normal driving speed of 45 miles an hour. On the 131-in. model, the drive shaft has two universal joints, while the larger chassis is equipped with three universals of the cross-and-trunnion type.

The four-wheel service brakes with which both models are equipped are of the hydraulic, self-equalizing type. The total braking contact area is 225.05 sq. in.

Among the standard bodies available on the 131-in. chassis are the stake body for general hauling, with sides somewhat lower than the cab and with hinged center sections, and a semi-trailer outfit with open-van trailer body, with a double-line attachment for operating the trailer brakes from the cab. An 11-ft. stake body is available for the 157-in. wheelbase chassis.

Superintendents Meet at Cleveland

(*Continued from page 159*)

being accomplished in time to move on scheduled fast freight trains. Intermediate diversion points are frequently used for stand-back purposes, and cars are held for no other purpose. Unless local officers take more than passing notice, the diversions will not be accomplished and there will be delays that cannot be accounted for or defended.

Another feature which contributes largely to payments on these commodities is the shifting of cars from one place to another to find a buyer. Cases have been known where cars have been diverted when, in the judgment of the agent, they would not reach destination in favorable condition. It would seem proper, therefore, that a limitation should be placed on the number of diversions, the extreme number to be three or possibly four or five.

Considerable has been said as to the necessity for the railroads furnishing to the shipping public a perfect service, free from defects in delays, refrigeration, and rough handling, but that is not enough. The carrier must, if necessary, show that a perfect service was furnished by means of a record that is positive in its nature, that will show exactly what moves were made. The phrase "no record of defects" has outlived its usefulness and is of no value. Safety lies in providing a perfect service supported by a perfect record.

Each car, particularly carload perishables, should be accompanied by a record from origin to destination, carefully filed where it can be reached with a minimum of effort, and later the report or copy of it attached to the claim papers for the consideration of the claim investigator. It would be better were this record to accompany the car and be filed at a central office of destination, so that in one moment the record could be lifted from the permanent file and attached to the claim papers. It is suggested that there be a conductor's report, a destination report, an icing and inspection report, and that these be made as the car moves and be filed as suggested.

Discussion

In opening the discussion of this report, Joe Marshall (A.R.A.) stated that the elimination of incompetent employees will be accomplished on July 1 by the inauguration of railroad-controlled inspection bureaus by both the eastern and the western railways. He then presented statistics bringing the report of the committee up to date and further emphasizing the fact that although the number of cars of perishable traffic handled comprises only 3 per cent of the total, the claims paid on this traffic aggregate 48 per cent of all claim payments. H. C. Rochester (Can. Natl.) referred to a "refrigometer" that is under trial on his road, which shows at all times on the outside of the car what the temperature is inside, the purpose of which is to enable a closer check to be kept on temperatures within cars, and to curb excessive use of ice.

A Communication . . .

Railway Purchases and Business Recovery

St. Louis, Mo.

To the Editor:

It has seemed to me that the whole industrial situation is tied up so closely with railroad purchases that increases in these purchases will not only increase the traffic of the railroads but will also increase the income obtainable from their sale of scrap iron, which is just as real and tangible as operating revenues.

A year ago, railroad heavy melting steel was being sold to steel plants in the St. Louis district by brokers at $5.75 per gross-ton delivered at the buyers' plants, which was the lowest price on record up to that time. It was our contention at the time that a comparatively slight increase in the rate of operation at the steel plants would boost the price of scrap not less than $3 per ton. Subsequently, the price of scrap declined from 75 cents to $1 per ton more, as a result of inactivity of the steel plants. As a matter of fact, during the past year, the railroads in this district marketed large tonnages of scrap at ridiculously low prices. A great deal of this was sold at less than the freight rate from the point where the scrap is accumulated. For instance, unprepared scrap has been shipped from Pine Bluff, Ark., and sold delivered in St. Louis for less than $2 per ton, while scrap has been shipped from Sedalia, Mo., to St. Louis and sold there for $2 or less per ton delivered. Recently, however, with the upturn in steel mill operations, railroad scrap, which was selling at $5.75 in May, 1932, and subsequently for about $4.75 to $5, jumped almost overnight to approximately $9, an increase of from $3 to $3.25 per ton over the price of May, 1932, and about $4 over the lowest point.

Railroad buying of cars would have caused this same increase. The railroads of this country market around 7,000,000 tons of scrap per year. Hence, it is easy to figure the increased revenues that would be derived by the railroads on the sale of scrap, due to a moderate increase in the rate of steel mill operations. Based on the average cost and weight of a steel gondola car, it was our contention that the revenues derived by the railroads from hauling the materials necessary to make a car, plus the enhanced value of railroad scrap caused by car buying, would have paid for about 50 per cent of the cost of the car.

It seems idle to talk about the railroads having ample equipment to move the present traffic, when any informed person knows that the upturn in business already taking place will increase the freight movement to the point where the existing railroad equipment will not be ample to take care of the demand. The economical thing for the railroads to do, therefore, is to purchase that equipment when the purchases will go a long way towards increasing the freight traffic moving and develop sufficient revenue directly and indirectly to pay for 50 per cent of the purchase. The railroads are the only industry that can benefit immediately in such measure from their own purchases.

By financing such purchases, the government could accomplish more per dollar invested than in any other direction. Furthermore, a much smaller expenditure of money than might appear necessary would, if properly placed, prove sufficient to get business back to normal. When we came out of the war, we had a government debt of around $25,000,000,000. This represented money which had been spent in this country over about a four-year period, or, roughly, $6,000,000,000 or $7,000,000,000 a year. The dollar today will purchase about three times as much as during the war period in basic raw materials. Thus, about $2,000,000,000 per year should have much the same effect as the war-time purchases. The extra expenditure for war materials pushed all markets out of sight. Hence, it is logical that about $2,000,000,000 of expenditures at this time would likely have much the same effect, but it must be spent prudently.

While business has shown a decided upturn, purchases of cars, locomotives and track materials sufficient to bring railroad equipment up to the basis of what would be needed in normal times would be ample to eliminate the hazard of business sagging back, and the next thought would be to hold in check too rapidly advancing prices.

C. M. Day,
Vice-President, Hickman, Williams & Co.

NEWS

All Recapture Proceedings Dismissed by the I. C. C.

Issues order vacating final orders heretofore issued to recover excess rail earnings

The Interstate Commerce Commission, having under consideration Sections 205 and 206 of Title II of the Emergency Railroad Transportation Act, 1933, repealing the excess income provisions of Section 15a of the Interstate Commerce Act, has issued an order vacating the final orders heretofore issued by the commission for the recovery of excess net railway operating income in the following cases and dismissing the proceedings:

F.D.	*Carrier*
3898	Richmond, Fredericksburg & Potomac Railroad Company, Excess Income
3998	Wyandotte Terminal Railroad Company, Excess Income
3957	Tuckerton Railroad Company, Excess Income
3627	R. J. Darnell, Lessee of Batesville Southwestern Railroad, Excess Income
3659	Central Ry. Co. of Arkansas, Excess Income
8653	Oil Fields Short Line Railroad Company, Excess Income
3797	Lake Terminal Railroad Company, Excess Income
3758	Hannibal Connecting Railroad Company, Excess Income
3778	Jonesboro, Lake City & Eastern Railroad Company, Excess Income
5669	Prescott & Northwestern Railroad Company, Excess Income
3767	Indiana Northern Railway Company, Excess Income
3641	Blytheville, Leachville & Arkansas Southern, Excess Income
4157	Washington Run Railroad Company, Excess Income
3765	Illinois Terminal Company, Excess Income
3773	Ironton Railroad Company, Excess Income
3643	Brimstone Railroad & Canal Company, Excess Income
3972	Utah Railway Company, Excess Income
3906	St. Joseph Belt Railway Company, Excess Income
3856	Nevada Northern Railway Company, Excess Income
3903	Roscoe, Snyder and Pacific Railway Company, Excess Income

All other proceedings pending before the commission for the recovery of excess income, including those in which tentative reports have been issued, are also dismissed.

Freight Traffic in May

Freight traffic handled by the Class I railroads in the first five months of 1933 amounted to 100,017,521,000 net ton-miles, according to reports compiled by the Bureau of Railway Economics. This was a reduction of 9,270,673,000 net ton-miles, or 8.5 per cent, under that of the corresponding period in 1932, and a reduction of 46,072,574,000 net ton-miles, or 31.5 per cent, under the same period in 1931. Railroads in the Eastern district for the five months period reported a reduction of 9.1 per cent in the volume of freight traffic handled compared with the same period in 1932, while the Southern district reported a reduction of 4.7 per cent. The Western district reported a reduction of nine per cent.

The freight traffic handled in May amounted to 21,731,663,000 net ton-miles, an increase of 1,859,801,000 net ton-miles, or 9.4 per cent, above that of the same month in 1932, but 8,283,884,000 net ton-miles or 27.6 per cent under May, 1931. In the Eastern district, the freight traffic in May was an increase of 6.8 per cent compared with the same month in 1932, while the Southern district reported an increase of 11.5 per cent. The Western district reported an increase of 12.3 per cent.

New North Carolina-Chicago Service on Southern

The Southern, on July 11, established through sleeping car services between points in Central North Carolina and Chicago. The new through cars will be added to the Carolina Special and thus Raleigh, Greensboro, Winston-Salem, and Asheville will have through services to Chicago whereas heretofore it had been necessary for passengers from these points to change trains at Cincinnati, Ohio.

Report on K. C. S. Labor Controversy Referred to Co-ordinator Eastman

The emergency board appointed by the President to investigate the controversy between the Kansas City Southern and the organizations representing its locomotive engineers and conductors regarding the new wage plan proposed by the management has rendered its report to the President, but instead of making it public, the President referred the matter to Commissioner Joseph B. Eastman, of the Interstate Commerce Commission, who is also federal co-ordinator of transportation, and it is understood he will make a report on the subject.

Co-operative Activities in East

The Eastern Regional Co-ordinating Committee met in New York on July 19 with H. J. German, eastern regional director representing Federal Co-ordinator Joseph B. Eastman. Simultaneously a separate meeting was being held by the law committee appointed last week by the Eastern Regional Co-ordinating Committee. The personnel of this law committee was given in the *Railway Age* of July 15, page 135.

Railways operating lighterage services in New York harbor, it is understood, are working on plans to pool these services, with the likelihood that a definite arrangement may be agreed upon at an early date.

Reduced Fares on L. & N. Bring Passenger Traffic

Travel figures, as yet inconclusive, raise hope that experiment will prove successful

While it is impossible to determine conclusively at this early date that the passenger fares of two cents a mile in coaches and three cents in Pullman cars, placed in effect by the Louisville & Nashville on April 1 are an unqualified success, a statement of the April business, just compiled, justifies hopes that they will be. In this, the first month in which the reduced fares were in effect, a total of 190,711 passengers were carried, or 78.7 per cent more than were carried in March, 1933, and 18.3 per cent more than in April, 1932. The passenger revenue in April increased $41,420, or 14.6 per cent, over March, 1933, though compared with April, 1932, there was a decrease of $116,533, or 26.38 per cent.

The average fare paid by passengers in April, 1933, was $1.70, as compared with $2.66 in March, 1933; and $2.73 in April, 1932. The average per passenger per mile in April, 1933, was 1.73 cents; in March, 1933, 2.74 cents; and in April, 1932, 2.98 cents. Passenger miles in April, 1933, totaled 18,788,114, exceeding those for March, 1932, to the extent of 8,431,669 miles, or 81.4 per cent; and those of April, 1932, by 3,860,819 miles, or 25.9 per cent. The average haul per passenger increased from 93 miles in April, 1932, to 97 miles in March, 1933, and to 99 miles in April, 1933.

The indications are that May and June will exceed April in passenger revenues. Additional trains have been put on and the traveling public is becoming more familiar with the advantages of the service. Newspapers, bill boards and other media are being employed and in conjunction with the paid advertising, employees are spreading the news among their acquaintances.

Rail and Barge Men Plan Co-Operation

An agreement to proceed with arrangements that will result in the co-operation of railroad and barge lines in the fixing of freight rates, was effected at a preliminary meeting held in St. Louis, Mo., on July 12, between officers of the Illinois Central and the Missouri Pacific and the Federal Barge Lines and the Mississippi Valley Barge Lines. Under this agreement, no party will reduce rates on competitive traffic without first consulting with the others.

Missouri River Project Opposed by Railroads

Protest of carriers, filed with War Department, discusses all angles of proposal

"A sufficient flow cannot be made to order even by the federal government." This is one of many significant statements embodied in a protest against the proposed project for a nine-foot channel in the Missouri river, from its mouth to Sioux City, Iowa, filed with the United States War Department on July 10, by the Chicago & North Western; the Chicago, Burlington & Quincy; the Chicago, Milwaukee, St. Paul & Pacific; the Chicago, Rock Island & Pacific; and the Northern Pacific. This protest, which appears in a pamphlet of 41 printed pages, discusses the project from all angles, including the excessive cost, the futility of reservoirs as a means of equalizing the flow, the extravagant claims for benefits to adjoining lands, and the unwarranted estimates of the potential traffic, and points to the surplus of transportation facilities that would result from completion of the alleged improvement.

With respect to the cost, the protest points to the fact that the total cost of a six-foot channel in the Missouri river from Kansas City to its mouth, will actually run in excess of $76,000,000, whereas in 1912, such an improvement was estimated to cost only $20,000,000. The annual maintenance expenditures will amount to more than four times the original estimate of $500,000. In view of this and the extremely unstable character of the channel of this stream, and the long series of unfortunate experiences with regulatory structures, the statement questions the accuracy of any estimates that may be made of the cost of providing a nine-foot channel, and casts grave doubts on the success of efforts to provide a channel of such depth at any price.

Reservoir projects along the upper reaches of the Missouri have been advocated to serve the common purposes of irrigation, water power, security of local water supplies, equalization of the flow for navigation, and flood control; but, as pointed out in the protest, these various requirements are conflicting, the requirements of irrigation, for example, consuming the maximum amount of the available storage at the same time that it would be needed to maintain the required channel depth. "The fact is," says the protest, "that a much greater than available volume of river flow during periods of low water will be required to make a navigable waterway of the Missouri river. It may be doubted whether for many years there would be sufficient flow during the drier months of the navigation season, which, by the way, are those months in which the maximum traffic requirements exist, to maintain a navigable waterway practicable for continuous commercial barge transportation."

In regard to traffic, attention is directed to the fact that above Sioux City, Iowa, the navigation season would normally be limited to the period from the first of April to the middle of November, assuming that there would be enough water in the channel during the summer and early fall. To be of use, therefore, the grain crops would have to be moved immediately after harvesting, or be held until spring. Attention is directed also to the fact that the more productive areas are remote from the river and that the products of areas located any appreciable distances east of the river would naturally move east rather than to the west for transfer to river barges. A parallel situation would apply with respect to coal movements up the river, and in addition, the transportation of both grain and coal would require large expenditures for transfer facilities at many small shipping points, as well as large storage facilities, owing to the long period when the river is closed to navigation each winter.

Pointing to the unnecessary duplication of transportation facilities to be incurred by this proposed project the protest states, "The traffic which would be diverted to the river would simply be at the expense of the dislocation of existing transportation facilities in favor of one untried and perilous; and subject to many untoward physical difficulties, and undoubtedly much more expensive than are the present methods of transportation. Whatever movement there would be through artificial, expensive channels of commerce would simply injure the activities along other routes."

Regulated To Death

Recently an Eastern railroad was ordered to replace a highway bridge over its tracks with a new one capable of sustaining heavier loads. The old bridge was adequate for ordinary road traffic, but not for heavily loaded trucks.

So it was put up to the railroad to improve the highway for the benefit of truck haulers, competitors of the railroad.

Absurd? Yes, but it is not fiction or a fairy tale. It is an exaggerated instance of what has been happening all over the Country. Railroads are hemmed in by regulations on every hand, fixing their rates, the hours and conditions of employment, and requiring standards of service. In theory their rates are adequate to provide a return on the investment, but practically they have not been doing so for some years, except in a few cases.

Railroad managers and financiers of the older days were guilty of buccaneer tactics, and their sins have been visited on the present innocent generation of railroad stockholders and bondholders. Considering the multitude of discriminatory public regulations the modern railroads have had to work under, it is a wonder so many of them have been able to weather the depression period without receiverships.

From the Minneapolis Journal

Glass Named for Board of Mediation

President Roosevelt on July 13 appointed Frank P. Glass, publisher of the Montgomery, Ala., Advertiser, as a member of the United States Board of Mediation.

Scope of Private Freight Car Investigation Outlined

I. C. C. issues notice in connection with Part 5 of its general Ex Parte 104 inquiry

The Interstate Commerce Commission has issued a notice outlining the scope of its investigation of the use of private freight cars, as a part of its general investigation in Ex Parte No. 104, on which hearings are to be begun in Chicago on July 31. This part of the general inquiry is to establish facts concerning the following:

(1) The extent to which the use of private freight cars is due to the failure of the respondent carriers to provide an adequate supply of cars for the transportation of products offered by shippers, and with especial reference to products requiring to be moved in refrigerator cars, tank cars, live stock cars and live poultry cars.

(2) The use by shippers of private freight cars when an adequate supply of railroad owned equipment is available.

(3) The reasonableness of mileage and other payments made by railroads to owners or lessees of private cars.

(4) The practices of carriers in absorbing charges—other than mileage charges—paid for the use of private freight cars.

(5) The extent to which auxiliary services are furnished free of cost to shippers making use of private freight cars.

(6) The extent to which respondent carriers accede to demands of shippers for private freight cars of particular ownership.

(7) The extent to which respondent carriers permit shippers to use private refrigerator cars for shipments not requiring the protection of this type of equipment.

(8) The extent to which respondent carriers are transferring perishable shipments enroute, or acquiescing in such transfer by or for account of the shippers, owners or consignees, from refrigerator cars of railroad ownership or control to private refrigerator cars.

(9) And to enable respondent carriers to bring down to date, insofar as they may desire, the information furnished by them in response to the questionnaire previously served in this proceeding.

(10) Also as to any other features, practices, conditions, and/or matters pertaining to or involved in the use of private freight cars upon the lines of respondents.

For the convenience of all concerned it is proposed to deal first with the refrigerator cars, second with tank cars, third with stock cars, fourth, private coal and coke cars, and fifth with miscellaneous private cars. While it is difficult to fix exact dates when the various interests can be heard, it is now anticipated that the first week, July 31 to August 5, will be devoted to refrigerator cars; August 7 to 10 to tank cars; August 11 and 12 to stock cars; August 14 to coal and coke cars; and August 15 to miscellaneous private cars.

New Highway Carrier Law Passed in West Virginia

Increased regulation provided along with additional fees for use of public roads

Increased regulation for motor carriers, including additional fees for their use of the highways and reduced size and weight limitations, are provided in legislation enacted in West Virginia. The act, which was passed on the last day of the recent special session, became a law without the approval of the governor.

Regulatory control over motor vehicle operations is given to the state road commissioner and no vehicle will henceforth be permitted to operate as a carrier of passengers or property for hire unless the operator obtains a permit or certificate of convenience. Applications for permits must be accompanied by such information as to equipment and financial condition as the commissioner may require. If the certificate sought be for operations over a regular route or between fixed termini the commissioner is empowered to prescribe routes, schedules, rates and other conditions. Operators without fixed termini or regular schedules are required to charge the same rates as those charged by regularly-scheduled vehicles in the same territory. No permit or certificate is granted until operators have filed with the commissioner a surety bond or liability insurance.

For the purpose of assessing fees for the use of the highway, vehicles are divided into several classes. Annual fees for private trucks vary from $15 for a pneumatic-tired vehicle of one ton capacity or less to $540 and $810, respectively, for a pneumatic-tired and a solid-tired 10-ton vehicle. For each additional ton over 10 the assessment is $100 for pneumatic-tired vehicles and $150 for solid-tired trucks. Trailers operated privately are assessed similarly, the maximum being $585 for a solid-tired 10-ton trailer with $150 for each additional ton over 10. The maximum charge for privately-operated semi-trailers is $255 for a solid-tired 10-ton vehicle with an additional $125 for each ton over 10.

One scale of charges, based on weight, applies to all tractors whether in private or for-hire service. The scale varies from the $25 charge for a tractor of two tons or less in weight to $192 for one weighing 10 tons; the charge for each ton over 10 is $240. Tractors used exclusively for agricultural purposes are exempt.

Passenger carriers operating over regular routes are assessed a registration fee of $80 per year for each vehicle of 21-passengers capacity or less used in regular service and of $120 for vehicles of greater capacity. In addition they pay a fee of 1/13-cent per seat-mile. Other passenger carriers for hire pay a registration fee of $75 a year.

Except for slightly higher charges on vehicles in the lower weight classes, assessments on regularly-operated for-hire trucks are the same as those on private trucks, reaching a maximum of $810 for a solid-tired vehicle of 10 tons capacity with an additional charge of $150 for each ton over 10. In addition, however, these trucks pay ⅛-cent for each potential ton-mile, i.e., capacity in tons multiplied by the scheduled miles. For-hire trucks without regular routes pay no ton-mile fees but are assessed double the registration fees of private trucks. Trailers operated for hire over regular routes are assessed fees reaching a maximum of $1170 for a solid-tired 10-ton trailer with an additional charge of $175 for each ton over 10. The maximum on similarly-operated semi-trailers is $510 plus $125 for each ton over 10.

For purposes of registration and fixing of fees the manufacturer's rated capacity is accepted although, if a vehicle be guaranteed by the manufacturer for a capacity greater than the rated capacity, the guarantee governs. Progressive restrictions are placed on loads in excess of rated capacity; a vehicle of more than four tons rated capacity, for example, may carry only a 25 per cent overload.

The specifications sections fix the length limit for a single vehicle at 35 ft. and for a combination at 45 ft. The previous length limit was 85 ft. Weight limits vary as between types of highways and load limits of bridges.

Other provisions forbid rebates and fix penalties for violations of the act. Also there is the "saving clause" which stipulates that if any section be held invalid, such decision shall not affect the validity of remaining provisions.

"I cannot close without paying a tribute to the vision, the ability and the courage of our railroad executives.

"The unhappy experiences of the past three years have revealed the soundness of the railroad program, which contemplated in general the maintenance of profitable freight rates, the payment of decent wages, and a fair price for the products purchased.

"Their constructive policy stands out now as the only wise leadership of the depression period.

"In sharp contrast, our bankers, our business leaders and our industrial heads could not have deliberately adopted any plan more effective in contributing to the gruelling pressure of deflation than by the policy pursued of price cutting, wage reduction and profitless sales.

"The railroad policy is the exact program now adopted by President Roosevelt to lead business and industry out of the depths. The declared objective of the administration is to advance commodity prices, and undoubtedly such higher prices should in due course be well in line with the basis now reflected by the freight rate structure.

"There is a growing appreciation of these efforts of our railroad leaders and a more intelligent understanding on the part of the public as to the vital place the railroads occupy in every scheme of business recovery; and I think there is now little popular sympathy with the application pending in Washington for reduction of freight rates as a whole."

From remarks of A. W. Vogtle, Birmingham, Ala., before the Southern Coal & Coke Committee at Chicago, June 15.

Reduced Rates on Sugar Permitted by the I. C. C.

Lower rail charges are designed to meet competition of water and highway carriers

Extensive reductions in railroad freight rates on sugar, proposed by the railroads last year to meet water and motor-truck competition, have been found in part justified by the Interstate Commerce Commission in a report dated July 3 made public on July 14. In some instances the commission, however, requires rates somewhat higher than those proposed by the carriers. The proposed reductions from eastern cities on and near the Atlantic seaboard to points in central territory, based on 27.5 per cent of first class, were found justified. Those based on a minimum carload weight of 80,000 lb. from southern refining points to Chicago, St. Louis, and other destinations in the Illinois district and intermediate territory were ordered cancelled, without prejudice to the filing of new ones providing rates 4 cents higher. Similar rates based on a minimum of 60,000 lb. were found justified. The rates proposed from Louisiana refining points to points in Arkansas, Missouri, and Oklahoma were ordered cancelled, without prejudice to the filing of new ones on a basis of 20 per cent of first class. Upon reargument, transcontinental carriers were granted fourth section authority, subject to conditions, to establish lower rates on sugar from San Francisco bay points to Chicago, St. Louis, and related points than to intermediate points; and western carriers were given similar authority to establish lower rates from western beet-sugar manufacturing points to Chicago, St. Louis and related points than to intermediate points. Commissioners McManamy, Lee, and Tate objected to granting fourth section relief.

"These five cases," the report said, "represent collectively a contest among railroad, water, and motor-truck carriers for that great volume of carload sugar traffic which moves from Atlantic and Pacific coast and Louisiana cane-sugar refining points and from interior beet-sugar manufacturing points to central territory and certain middle western points, and particularly to Chicago, the country's largest market. They, of course, involve indirectly business strife among sugar interests having plants at competing origin points. In the main they embrace the same traffic as *Sugar Cases of 1922*, 81 I. C. C. 448, out of which came a general readjustment of the all-rail sugar rates, representing a compromise on the part of the principal shippers and rail carriers, which has stood without substantial modification for about 10 years. However, conditions have now materially changed. Water and truck carriers maintain much lower rates and have made serious inroads on the traffic of the rail carriers and are threatening soon to take still more of it. To cope with the situation the respective sets of rail carriers serving the origin groups mentioned are seeking, independently of each other, drastic, sweeping, and quick reductions in rates. They are doing so with the hope of retrieving their losses to at least some

extent. If the proposed reductions do not have the desired result and revenues from sugar go still lower, the rail carriers expect to console themselves with the thought that the present rates, if continued, would cause them even greater losses. In other words, they are willing to make these reductions rather than run the risk of the further losses which continued maintenance of the existing rates might entail. Their proposals are thus largely in the nature of insurance measures against undue losses in the future. The rail carriers feel that they should at least be given an opportunity to test the effect of these reductions. They may consider even lower rates if those proposed are established and do not prove sufficiently effective. They are in poor financial condition and need increased revenue."

Regarding the proposed eastern rates the commission's report said:

"By the proposed rates, representing reductions of about 27 per cent, respondents hope to divert sufficient traffic from the water and truck carriers to more than offset the revenue they would lose on the traffic that would move by rail regardless of the reductions. The reductions would result in a loss of revenue if respondents did not increase their sugar traffic by about 40 per cent, or 125,000 tons. If a revenue loss results, respondents, as already indicated, are willing to take it to avoid the greater loss that might result from continued maintenance of the present rates.

"Respondents are not undertaking to meet the water and truck competition with exactitude at any particular point. They regard the competition as too widespread and the situation as too involved to be so dealt with. They are proposing general reductions because they are convinced that the general level of their sugar rates, though reasonable, is too high as a practical business proposition. Within and between trunk-line and New England territories they have already reduced their rates to the class basis here proposed.

"Just what rates the water carriers are charging is impossible to say. Being unregulated, they do not have to publish their rates, are free to change them at will without previous notice, may pay rebates, give allowances, make absorptions, provide storage, perform special services, allow special privileges, and otherwise, secretly or openly, favor individual shippers. The record indicates that these things, representing concessions of several cents per 100 pounds, are indulged in to a very considerable extent by water carriers from New York. As they are matters particularly within the knowledge of the water carriers and as those carriers have not offered us sufficiently definite advice in regard thereto, we may be justified in giving respondents the benefit of any doubts. What is here said about the water rates is also more or less true of the truck rates. The water and truck-rate data used herein were compiled in 1932. There is no telling whether or not the same rates will be applied this year. They may be several cents higher or lower.

"The indications of record are that most of the eastern refined and import sugar that went through the New York State Barge Canal in 1932 moved from New York to the lake ports of Chicago, Detroit, Toledo, and Cleveland at an initially charged rate of about 27 cents, generally subject to a minimum of 200 tons. By "initially charged" rate we mean the rate applied when the shipment was billed out, as distinguished from the rate ultimately charged under any rebating arrangements, which may or may not have included free accessorial services. In many instances, affecting a large portion of the traffic, the rates initially charged ranged from 22 to 25 cents.

"After inquiring into the question of what the water and truck rates are and what should be added roughly to represent unknown amounts for storage, switching, transfer, and other services, we are faced with the question of how much more the rail service is worth in actual practice. Rail shipments generally reach destination in from four to six days, but water shipments are on the way two or three weeks. Rail service is also superior in that it is safer, involves less handling of and damage to packages, is more regular, and otherwise more dependable. Shipments by rail can be reconsigned or stopped in transit for partial unloading at nominal charges. However, unlike water service, rail service does not include loading and unloading, which cost the shipper perhaps 3 or 4 cents per 100 pounds. Water service can be used for a large part of the traffic without great inconvenience or disadvantage, rapid transit being generally unnecessary, but in certain respects, particularly at times, water service is not suitable for special shipments. Water service is never more desirable than rail service, except for reasons of economy or where slow movement is desired as a substitute for storage or in the case of a rising market. The traffic manager of one of the New York refiners testified that he would expect to ship a reasonable proportion of his sugar by rail at a rate 10 cents above the water rate. He thought that that difference would provide equality of opportunity for the rail lines as against the water lines. This expression would be more helpful if we were sure that most of the shippers concurred therein. During these days when business men have to watch every penny, there is a strong inclination to use the cheapest mode of transportation, even though not altogether satisfactory. It would also be more helpful if we knew what the water rates were. If some water shipments pay 22 cents and others as much as 27 cents, the question arises as to what the rail rate should be.

"Refiners favor the reductions. They have no particular interest in the intrinsic level of properly related rates, as the freight charges are generally borne by other parties, but they would prefer to use the railroads for most of their traffic if the rates of the different transportation agencies were on a parity, service considered. They desire the rail lines to be strong and dominant in the field of transportation. They are less interested in the other carriers, because the services of those agencies are less dependable and because the rates they charge are unknown, unstable, result in discrimination, and have the effect of disturbing the sugar-price structure."

Cut-Off Control Improves Locomotive Performance—A Correction

In the third sentence, third paragraph, of the article entitled "Scientific Cut-Off Control Improves Locomotive Performance," which begins on page 111 of the July 15 issue of the *Railway Age*, the word "able" should be "unable," and the sentence should read: "While every effort has been made to teach the theory to the enginemen and to demonstrate it to them in practice, yet as a whole they have been and continue to be unable, without a guide, to achieve in regular service efficient or economical operation comparable with results produced during tests."

German State Railways to Expand Store-Door Service

Further development of its door-to-door freight service is planned by the German State Railways which has just decided to place an order for 1,100 new trucks, according to recent reports received by the U. S. Commerce Department.

It is expected that these trucks will be placed in service this year and that a larger number will be purchased in 1934. The trucks range in capacity from three to five tons.

June Locomotive Shipments

June shipments of railroad locomotives from principal manufacturing plants as reported to the Bureau of Census, United States Department of Commerce, totaled two locomotives as compared with one in May, 17 in June, 1932, and 23 in June, 1931. Unfilled orders at the end of June totaled 71 locomotives, including two steam and 66 electrics on domestic orders and three steam on foreign orders. At the end of May unfilled orders totaled 70 locomotives while the total as of June 30, 1932, was 129.

These figures do not include data on locomotives built by railroads in their own shops.

Loans May Be Made to Railroads for Grade Crossing Elimination

In connection with the program for extensive highway construction work for which $400,000,000 has been alloted under the government's public works program, Henry T. Hunt, general counsel for the Public Works Administration, has ruled that where advances are made to states and local governments for grade crossing elimination, as proposed in the law, loans may also be made to railroads for their share of the cost of the work. The matter of loans to railroads for maintenance and equipment, for which provision is made in general terms in the public works law, has also been under consideration but no definite policy has yet been formulated.

Georgia Fruit Traffic

The movement of peaches and watermelons from the south by railroad in 1933 has been heavier than in recent years, and good prices have been obtained. This statement is made in one of the newspaper messages of the Central Railroad of Georgia to the people of Georgia and Alabama. At the same time the fruit growers are

reminded that the only safe and satisfactory kind of transportation to the long distance markets is the railroad. The railroads assist in stabilizing the markets, while business done by motor trucks is often accompanied by "dumping." Georgia peaches have this year been sent northward in carload lots by express. The express rates are nearly double those by freight but the buyers seem to be satisfied that the new arrangement is profitable.

Ward W. Adair Honored

Harold S. Vanderbilt, chairman of the New York Central Railroad Branch of the Y. M. C. A., New York City, on Wednesday evening gave a dinner at the Racquet and Tennis Club in honor of Ward W. Adair, who on July 1 retired as general secretary of that branch. Mr. Vanderbilt paid high tribute to the work of Mr. Adair, who has just finished 41 years of service with the Y. M. C. A., 25 of it in charge of the Railroad Branch in New York City. Among the other speakers were F. E. Williamson, president of the New York Central Lines; J. L. Ellenwood, New York State secretary of the Y. M. C. A., and Walter T. Diack, general secretary of the Y. M. C. A. for New York City. The members of the board of managers of the Railroad Branch presented Mr. Adams with a loving cup.

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States *

Compiled From 150 Monthly Reports of Revenues and Expenses Representing 151 Class I Steam Railways

FOR THE MONTH OF MAY, 1933 AND 1932

Item	United States		Eastern District		Southern District		Western District	
	1933	1932	1933	1932	1933	1932	1933	1932
Average number of miles operated	241,000.20	241,657.53	59,510.87	59,718.92	45,810.26	46,181.38	135,679.07	135,757.23
Revenues:								
Freight	$207,489,911	$194,189,149	$86,683,452	$84,750,629	$42,176,159	$37,180,667	$78,630,300	$72,257,853
Passenger	23,911,176	31,329,584	14,491,009	18,683,304	2,752,841	3,434,635	6,667,326	9,211,645
Mail	7,636,430	8,118,695	2,993,831	3,206,906	1,328,307	1,391,041	3,314,292	3,520,748
Express	5,491,176	5,908,355	2,125,866	2,523,269	1,294,671	1,124,213	2,070,639	2,260,873
All other transportation	6,085,185	6,718,362	3,358,322	3,894,825	533,607	515,131	2,193,256	2,308,406
Incidental	4,163,711	5,145,506	2,344,196	3,042,978	633,649	684,959	1,185,866	1,417,569
Joint facility—Cr.	638,147	745,350	201,390	259,827	170,471	134,984	266,286	350,539
Joint facility—Dr.	159,984	233,285	48,982	64,722	15,470	16,062	95,532	152,501
Railway operating revenues	255,255,752	251,921,716	112,149,084	116,297,016	48,874,235	44,449,568	94,232,433	91,175,132
Expenses:								
Maintenance of way and structures	27,322,616	33,950,751	10,167,164	12,617,097	5,488,151	6,244,011	11,667,301	15,089,643
Maintenance of equipment	46,935,522	52,293,139	20,613,662	24,049,931	8,929,623	9,535,124	17,392,237	18,708,084
Traffic	7,086,865	8,476,981	2,599,476	3,321,653	1,351,523	1,462,385	3,135,866	3,692,943
Transportation	86,845,661	95,384,914	39,873,276	44,792,585	14,900,289	15,710,690	32,072,096	34,881,639
Miscellaneous operations	1,704,443	2,332,449	851,941	1,178,709	191,613	253,100	660,889	900,640
General	11,827,034	13,202,464	5,018,481	5,785,415	2,088,169	2,221,994	4,720,384	5,195,055
Transportation for investment—Cr.	138,105	418,549	41,724	143,353	15,634	23,508	80,747	251,688
Railway operating expenses	181,584,036	205,222,149	79,082,276	91,602,037	32,933,734	35,403,796	69,568,026	78,216,316
Net revenue from railway operations	73,671,716	46,699,567	33,066,808	24,694,979	15,940,501	9,045,772	24,664,407	12,958,816
Railway tax accruals	22,388,349	24,449,831	9,558,394	10,120,503	4,154,197	4,649,244	8,675,758	9,680,084
Uncollectible railway revenues	79,611	91,638	40,775	29,475	12,783	16,195	26,053	45,968
Railway operating income	51,203,756	22,158,098	23,467,639	14,545,001	11,773,521	4,380,333	15,962,596	3,232,764
Equipment rents—Dr. balance	7,487,068	7,565,043	3,458,854	3,596,455	963,701	682,073	3,064,513	3,286,515
Joint facility rent—Dr. balance	3,023,615	2,927,351	1,652,723	1,515,329	363,798	342,990	1,007,094	1,069,032
Net railway operating income	40,693,073	11,665,704	18,356,062	9,433,217	10,446,022	3,355,270	11,890,989	*d 1,122,783*
Ratio of expenses to revenues (per cent)	71.14	81.46	70.52	78.77	67.38	79.65	73.83	85.79

FOR FIVE MONTHS ENDED WITH MAY, 1933 AND 1932

Average number of miles operated	241,238.77	241,666.35	59,551.60	59,716.69	45,868.96	46,157.84	135,818.21	135,791.82
Revenues:								
Freight	$911,479,309	$1,040,667,285	$389,788,856	$461,089,008	$194,615,140	$203,582,770	$327,075,313	$375,995,507
Passenger	119,021,936	168,641,156	72,227,113	100,075,104	15,509,352	20,938,961	31,285,471	47,627,091
Mail	37,637,447	41,027,571	14,773,124	16,151,955	6,497,739	7,031,948	16,366,584	17,843,668
Express	17,900,147	24,808,219	7,356,171	10,813,006	4,206,911	4,995,324	6,337,065	8,999,889
All other transportation	27,891,439	34,198,724	15,839,432	19,685,696	2,505,127	2,934,365	9,546,880	11,578,663
Incidental	20,681,887	27,785,150	11,929,729	16,349,831	3,154,871	3,792,830	5,597,287	7,642,489
Joint facility—Cr.	3,220,500	3,895,109	1,066,477	1,335,280	687,277	678,901	1,466,746	1,880,928
Joint facility—Dr.	906,413	1,197,729	260,045	352,463	86,550	93,822	559,818	751,444
Railway operating revenues	1,136,926,252	1,339,825,485	512,720,857	625,147,417	227,089,867	243,861,277	397,115,528	470,816,791
Expenses:								
Maintenance of way and structures	118,694,199	155,797,901	46,363,194	65,252,744	25,114,299	31,572,381	47,216,706	58,972,776
Maintenance of equipment	230,630,818	276,191,400	101,645,480	126,667,235	43,986,011	50,405,775	84,999,327	99,118,390
Traffic	35,385,751	42,749,567	13,077,953	16,533,923	6,852,820	7,907,416	15,454,978	18,308,228
Transportation	431,028,621	515,305,362	199,483,502	243,865,636	73,737,110	84,788,353	157,808,009	186,651,373
Miscellaneous operations	9,005,638	12,673,350	4,562,860	6,394,696	1,141,071	1,591,466	3,301,707	4,687,188
General	60,044,769	68,554,272	25,809,440	30,071,829	10,134,244	11,813,479	24,101,085	26,668,964
Transportation for investment—Cr.	1,168,157	1,682,972	535,109	571,238	146,583	109,313	486,465	1,002,421
Railway operating expenses	883,621,639	1,069,588,880	390,407,320	488,214,825	160,818,972	187,969,557	332,395,347	393,404,498
Net revenue from railway operations	253,304,613	270,236,605	122,313,537	136,932,592	66,270,895	55,891,720	64,720,181	77,412,293
Railway tax accruals	110,541,004	122,220,430	45,564,241	49,432,402	21,495,703	23,446,525	43,481,060	49,341,503
Uncollectible railway revenues	407,240	401,258	168,337	146,496	49,953	55,679	188,950	199,083
Railway operating income	142,356,369	147,614,917	76,580,959	87,353,694	44,725,239	32,389,516	21,050,171	27,871,707
Equipment rents—Dr. balance	34,299,980	35,865,245	16,848,996	18,013,664	3,292,023	2,696,913	14,158,961	15,154,668
Joint facility rent—Dr. balance	14,624,742	14,436,498	7,758,808	7,681,253	1,692,517	1,416,827	5,173,417	5,338,418
Net railway operating income	93,431,647	97,313,174	51,973,155	61,658,777	39,740,699	28,275,776	1,717,793	7,378,621
Ratio of expenses to revenues (per cent)	77.72	79.83	76.14	78.10	70.82	77.08	83.70	83.56

* Excludes switching and terminal companies. Statements prior to January, 1933, included switching and terminal companies.
d Deficit or other reverse items.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Air-Conditioned Trains Bring Business to B. & O.

Air-conditioned passenger trains have done more to bring back passenger business to the Baltimore & Ohio than any other factor, according to W. B. Calloway, passenger traffic manager of that road. "Especially is this true of long-distance travel from New York, Philadelphia, Pa., Baltimore, Md., and Washington, D. C. to Chicago and St. Louis, Mo.," Mr. Calloway said. "Because so many people are going to Chicago this summer to see A Century of Progress Exposition, long distance passenger business has picked up generally, but it becomes more and more apparent that persons going there prefer to travel on an air-conditioned train if possible.

"Nearly every day the entire berth space in the Capitol Limited of this road, which runs between New York and Chicago, has been taken up. To take care of this, arrangements have been made to operate this train in three sections twice a week, Tuesdays and Saturdays, for Chicago."

River and Harbor Projects in Public Works Program

A list of river and harbor improvement projects selected by the cabinet advisory board of the Public Works Administration from the list of such projects totalling $237,000,000 recommended by the War Department has been submitted by the board to the President but was returned to it on July 17 for further consideration. In all probability an allotment will be made for continuation of work toward the development of a nine-foot channel in the upper Mississippi river, it was stated at the White House.

The Public Works Administration has allotted $210,008 to the government's Alaska Railroad for reconditioning its entire system.

Henry Matson Waite, who since 1927 has been in charge of the construction of the new passenger terminal at Cincinnati as chief engineer of the Cincinnati Union Terminal Company, has been appointed deputy administrator of public works. Mr. Waite was engaged in railroad service for many years and served as deputy director general of transportation with the American Expeditionary Forces in 1918.

I. C. C. Finds Seatrain Lines Not a Railroad Extension

The Interstate Commerce Commission on July 19 made public its report on its investigation of Seatrain Lines, Inc., finding that the company is not a common carrier by railroad or an extension of a line of railroad within the meaning of those terms as used in the interstate commerce act and that it is not a carrier within the meaning of section 20a of the act, under which the commission regulates issuance of securities. The commission finds that the company is a common carrier by water engaged in the transportation of property partly by railroad and partly by water under a common control, management, or arrangement for a continuous carriage, and is therefore subject to all the provisions of the act applicable to such a carrier. The report also said that there is nothing in the record to indicate common control or management between Seatrain on the one hand and the Missouri Pacific, Texas & Pacific, or New Orleans and Lower Coast on the other and that the Hoboken Manufacturers' Railroad does not and may not compete for traffic with the Seatrain company. Commissioner Mahaffie dissented, saying he thought the operations of the company were described by the words "an improved car ferry." Commissioner McManamy concurred in this expression and Commissioners Meyer and Miller, concurring in part said they would find that the company's vessels are car ferries and in all respects subject to the provisions of the act.

Regulations Prescribed for Oil Transportation

Regulations to carry into effect the order issued by President Roosevelt last week prohibiting the interstate transportation of petroleum and products produced or withdrawn from storage in excess of the amount permitted by state authorities were issued by Secretary of the Interior Ickes on July 15, after the President had issued another order authorizing him to set up such agencies and promulgate such rules and regulations as he might deem necessary. The regulations provide that no transporting agency, whether by rail, pipe line, water, truck, or any means of conveyance shall receive for transportation any petroleum or the products thereof unless the shipper shall furnish and the transportation agency shall receive in good faith an affidavit containing a declaration that it is not in excess of the amount permitted. Carriers may, however, receive from other carriers and may transport petroleum and its products without requiring such affidavit and will not be subject to any liability or penalty for such receipt or transportation. The affidavits are to be filed and kept subject to inspection by the Division of Investigations of the Department of the Interior. Counsel for the Independent Petroleum Association, in a press statement, said that an effort would be made under the regulations to intercept a movement of nearly 600 tank cars of illegal oil from the East Texas field, begun on July 14 before the regulations were promulgated.

No Change in Rail Plan To Reduce Anthracite Coal Rates

D. T. Lawrence, chairman of the Trunk Line Association, denied, in a statement issued on July 18, that the attitude of railroads originating anthracite coal had changed with respect to proposed rate reductions on household sizes of anthracite moving over all-rail routes from mines in Pennsylvania to destinations in New England, Long Island and Westchester County, New York. The announcement of the carriers' intention to make these adjustments was published in the *Railway Age* of July 8, page 97.

Mr. Lawrence's July 18 statement follows:

"Attention having been called to press notices and rumors to the effect that the carriers originating anthracite have changed their attitude since their announcement of intention to make a readjustment involving certain reductions in the freight rates on anthracite all-rail to New England, Long Island and Westchester county, N. Y., we wish to say that we know of no basis whatever for such statements.

"The Interstate Commerce Commission has denied the carriers' application for authority to issue the new rates on less than statutory notice to the public, but the carriers are now preparing a new and more comprehensive application which will very shortly be presented to the commission, and it is hoped and expected that the new rates will be made effective by tariffs to be filed as soon as authority for certain contraventions of the Fourth Section of the Act to Regulate Commerce has been granted by the commission."

An Appeal For Stricter Discipline

Circular S-69, issued by the Safety Section, A. R. A., for the guidance of safety committees during the month of August, is addressed, as are most circulars of this class, to all officers and employees; but the appeal appears to be more specially to officers. The circular is illustrated by a half dozen cuts showing common kinds of carelessness, each one intended to enforce the suggestion that safety rules are of equal weight with the operating rules, so-called—the rules which have to deal with the management of trains and which, through the development of years have proved highly efficient as preservers of safety.

The "safety" rules, in the more modern use of that term, having to do more particularly with the duty of men to take care of themselves, as distinguished from taking care of the trains, may not necessarily be in a printed book; there is a general code of rules, written and unwritten, which all railroad operating men must follow if they are to be successful. The committee has observed, however, that officers who are strict in scrutinizing the performances of employees and in the correction of faults, in the operating rules, are not so strict in administering discipline when they see violation of the safety rules, so-called.

Where officers are close observers of violations of rules and take prompt action therewith, discipline becomes less acute and a spirit of rule observance is cultivated in the minds of employees. No man is to be disciplined for getting hurt, but it is sometimes important that he be disciplined for the act which resulted in the hurt. The desideratum, of course, is to detect and correct bad practice before it results in any bodily injury.

Less Regulation of Railroads Needed

Attention must be directed to less regulation of the railroads to enable them to build up a surplus in prosperous times to meet emergencies, according to LeRoy D. Owen, vice-president of the Westland Warehouses, Inc., in a recent address before the Economic Round Table of Los Angeles. And with less regulation railway managements will have less excuse for failing to operate economically or failing to pursue a sane financial policy.

"The primary object of federal regulation of railroads," he continued, "was to insure reasonable and non-discriminatory rates, but we find the government hamper-

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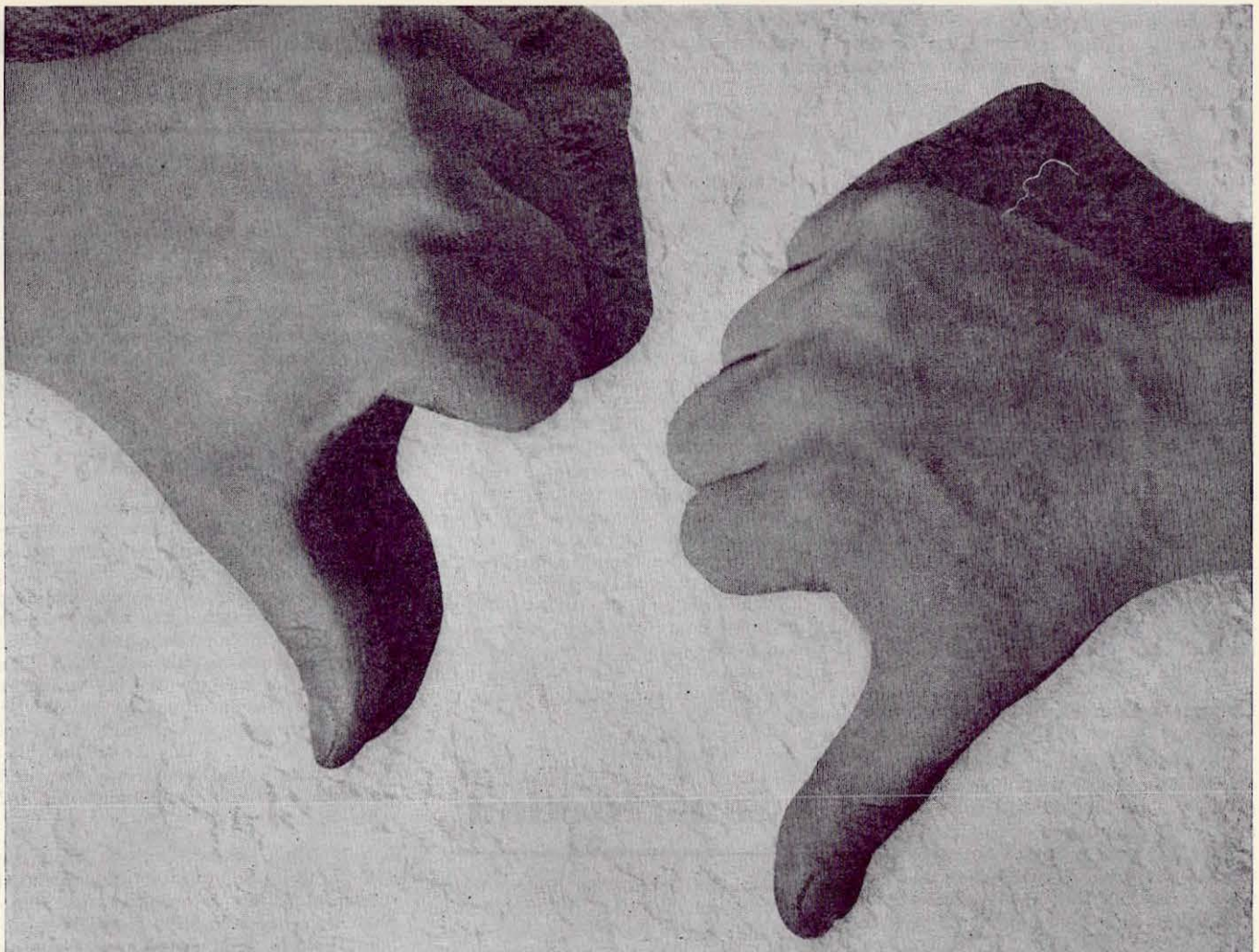

THUMBS DOWN

On the obsolete locomotive

WHEN you put new, modern locomotives in service a few years ago you saved money. « If you now return to service the old, obsolete locomotives that they displaced you will lose money. « Present operating costs are based on the use of your best power. « Have you enough of the new locomotives to handle increasing traffic at the same low cost?

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ing and hindering their operation and maintaining a huge governmental bureau at the expense of taxpayers and performing many functions properly belonging to railroad management. The total cost of this regulation has reached alarming proportions. For the 46 years of its existence, up to June, 1932, the cost of the Interstate Commerce Commission totaled $125,000,000, the average annual expenditure for the last ten years being $7,000,000. Besides this amount, the taxpayers of the nation assume an additional burden annually of approximately $6,000,000 for the support of the state commissions.

"Unnecessary or unduly elaborate regulation is not confined to rate questions. The Commission has invaded managerial functions in many instances and railroad executives are deprived of their proper responsibilities and opportunity of management. These regulations apply to the development of containers, locomotives and car equipment, automatic train control and other mechanical improvements. This has gone to such an extent that inventors of new devices frequently devote their main efforts to securing approval of the Commission, even prior to the submission of their plans to railway executives."

Collegiate Courses in Transportation, 1932

The Office of Education, Department of the Interior, has issued a circular, compiled by J. O. Malott, specialist in commercial education, containing data regarding the collegiate courses in transportation that were reported by the colleges and universities or published in the catalogs of such institutions listed in Office of Education Bulletin, 1933, No. 1, "Educational Directory: 1933."

A compilation of the data shows: That 191 colleges and universities offer one or more courses in transportation; that 247 members of the instructional staffs are assigned to these courses; and that 348 such courses are offered. There are 6,367 students, including duplicates, enrolled in these courses in the 173 institutions that reported their enrollments.

Of the 191 institutions, 140 reported only one course in transportation; 19, two courses; 14, three courses; 1, four courses; 5, five courses; 5, six courses; 2, seven courses; 1, eight courses; 1, nine courses; and 3 reported 10 or more courses.

The compilation shows further that in each of 163 of the 191 institutions only one instructor offers courses in transportation; in 17 institutions, two instructors; in 5, three instructors; in 2, four instructors; and in 4 institutions there are five or more instructors in transportation.

Only 19 of the institutions reported that they offered curricula in transportation in which students might major. These institutions reported an average of six courses and three instructors. Thirteen of these schools that reported their enrollments had an average of 196 enrolled in these courses. The six institutions reporting the number majoring in transportation reported an average of 17.

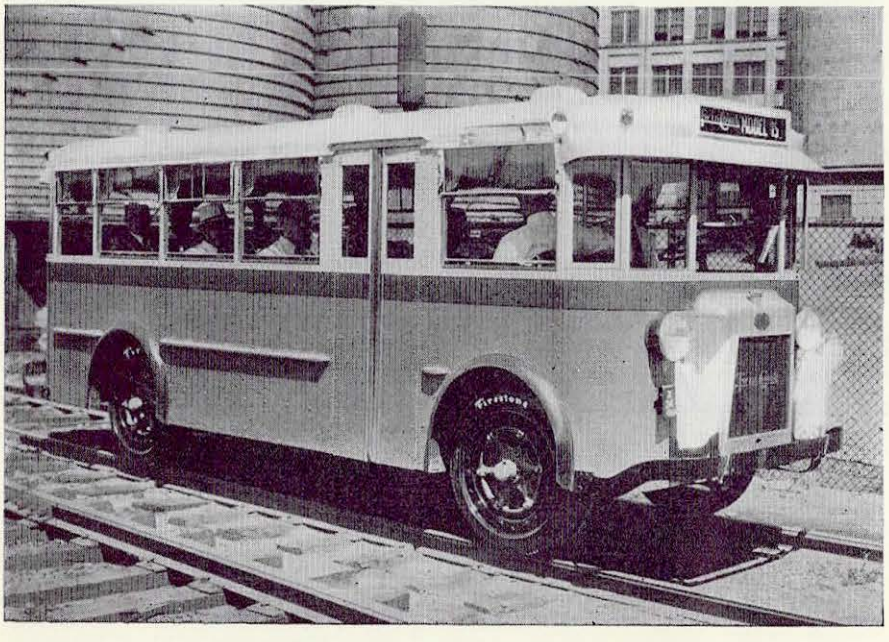
Eleven different curriculum titles in transportation are reported. Inasmuch as two or more curricula are reported by each of several of the institutions, there is an aggregate of 25 curricula reported in this field.

Construction

ALASKA RAILROAD.—The Public Works Administration has allotted $210,008 from the public works fund for reconditioning the entire system of the government's Alaska Railroad.

SOUTHERN PACIFIC.—The California State Highway Commission is contemplating the construction of a highway subway under the tracks of this company at Soledad, Cal., at an estimated cost of $120,000.

* * * *



Twin Coach Model Equipped with Firestone Pneumatic Rail Tires

Equipment and Supplies

FREIGHT CARS

E. I. DU PONT DE NEMOURS & COMPANY has ordered six tank cars of 10,000 gal. capacity, from the General American Transportation Corporation.

THE PENNSYLVANIA SALT MANUFACTURING COMPANY has ordered three 4,000-gal. tank cars, to be used for carrying muriatic acid, from the American Car & Foundry Company.

PASSENGER CARS

THE BALTIMORE & OHIO has given an order to the York Ice Machinery Corporation for air conditioning equipment for 20 additional passenger cars. These cars, comprising sleepers, chair cars, reclining seat cars, and coaches are to be used in the B. & O's. air conditioned service to the Century of Progress Fair at Chicago. The order calls for complete delivery within 11 days. The equipment will be installed at the B. & O. shops at Baltimore, Md., and Washington, Ind. The York Ice Machinery Corporation has already furnished equipment for air conditioning on 142 other B. & O. cars.

NEW YORK RAPID TRANSIT COMPANY (B. M. T.)—An order for the electrical equipment for the new multi-section aluminum train has been given to the Westinghouse Electric & Manufacturing Company subject to the approval of the Transit Commission, City of New York. This electrical equipment was developed by Westinghouse engineers and is expected to establish new standards for schedule speed, quick, smooth acceleration, and rapid braking. The train will be driven by 12 60-hp., high-speed, spring-supported, electric motors. A new multi-notch accelerator type of control will also have its first commercial application on the new train. The order for this train was reported in the *Railway Age* of July 1.

MACHINERY AND TOOLS

THE CHICAGO GREAT WESTERN is to install the following machine tools in its shops at Oelwein, Iowa, to replace obsolete machinery which is not suitable for work on modern, heavy locomotive equipment:

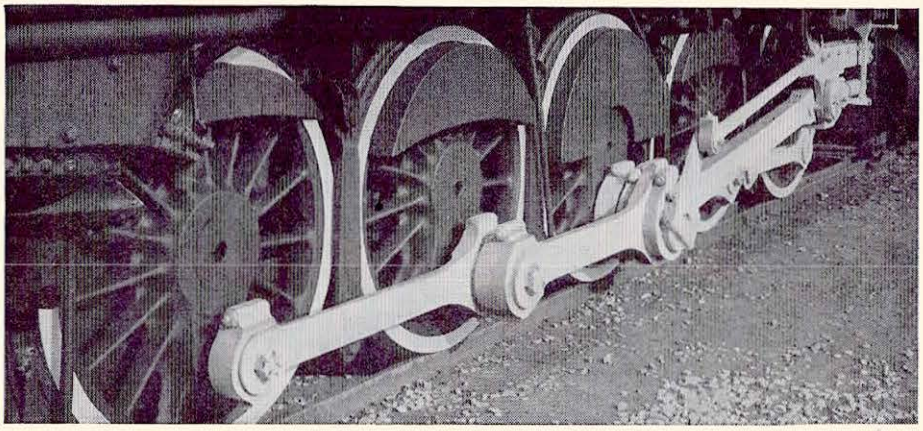
1 Locomotive driving wheel crank pin and double quartering machine
1 Special 38-in. stroke high-duty draw-cut shaper
1 18-in. by 8-ft. geared head engine lathe
1 24-in. by 14-ft. geared head engine lathe
1 36-in. by 16-ft. geared head engine lathe
1 800-ton 96-in. inclined type driving wheel press

SIGNALING

THE LONDON & NORTH EASTERN has given a contract for the supply and installation of automatic color light signals on its line from Hackney Downs to Seven Sisters Junction, about 3 miles, to the Westinghouse Brake & Saxby Signal Com-

Continued on next left-hand page

OVER 500 TANDEM MAIN ROD DRIVES



ARE REDUCING MAINTENANCE

BIG power has found relief from increasing rod maintenance by easing up on the work done by the main pin. • Until the development of the Tandem Main Rod Drive there was no way to meet the constantly increasing stress. • Instead of concentrating heavy thrusts on one set of main pins, the Tandem Main Rod Drive distributes it over two axles and four pins. This results in lower bearing pressures and reduced maintenance on all bearings. • Two groups of locomotives, identical except that one group has the Tandem Main Rod Drive, have been running nearly three years. • Locomotives with the Tandem Main Rod Drive are running far longer between shoppings than those not so equipped.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

pany, London, England. The signals will be of the searchlight type, with a.c. track circuits.

MISCELLANEOUS

THE FREIGHT CAR REPAIR FORCES have been increased by approximately 100 men on the Chesapeake & Ohio, and 50 men each on the Nickel Plate and the Pere Marquette.

Supply Trade

H. C. Thomas, assistant to general works manager at East Pittsburgh, Pa., of the **Westinghouse Electric & Manufacturing Company,** has been appointed sales manager of Micarta Products.

W. S. Gain has been appointed district sales manager for the Buffalo territory by the **Roller-Smith Company,** New York. Mr. Gain's headquarters are at 416 Lafayette building, Buffalo, N. Y.

Edward J. Bade, who has been employed in the laboratory of the **Dearborn Chemical Company,** Chicago, has been promoted to sales representative to succeed **A. C. Herrmann,** who has resigned to establish his own business.

At a meeting of the board of directors on July 13, **Col. O. F. Harvey** was elected a vice-president of the **American Car & Foundry Company,** New York. He had been an assistant secretary of the company since 1920.

A. F. Fifield, who has been in charge of the railway appliance division of the **American Fork & Hoe Company,** Cleveland, Ohio, has been elected president to succeed **George B. Durell,** who has been elected chairman of the board.

The United States Steel Corporation has authorized an additional three million tons of iron ore to be shipped from its northern mines, effective at once. This will put 27 more ore vessels in service on the Great Lakes and correspondingly increase all mining and transportation activities to plants. This will be a distinct gain to employment in all the districts affected.

The General American Transportation Corporation, Chicago and New York, has acquired on the Atlantic Seaboard a large liquid storage terminal. The property is that of the American Mineral Spirits Company, located at Carteret, N. J., opposite Staten Island, N. Y. The capacity of the terminal will be doubled; it will be equipped for the handling of all types of bulk liquids and will have a storage capacity of 30,000,000 gal. The site covers about 30 acres including tidewater docks and piers for ocean-going tankers.

Frank E. Case, assistant to the engineer of the transportation department of the **General Electric Company,** at Erie, Pa., has retired after 42 years of service with the company. Mr. Case entered the employ of the Thomson-Houston Electric Company, at Lynn, Mass., in 1891, shortly before the formation of the General Electric Company. In 1894 he was transferred to the Schenectady works, where for 20 years he was engineer of the railway equipment department. In 1926 his department was transferred to the Erie works, where he was in charge of the motor and locomotive design division in addition to railway control. In 1930 the design sections of the transportation department were consolidated with the general engineering division, and Mr. Case became assistant to the engineer of the department. More than 100 patents were taken out by Mr. Case, particularly in the field of control equipment. On four occasions he was sent to Europe in connection with engineering problems of foreign customers of the General Electric Company. During one of these visits he worked several weeks on the initial 1500-volt electrification of the Paris-Orleans Railway of France. He was also intimately connected with the earlier subway installations of the Metropolitan Underground Railway in London, England.

Iron and Steel Industry Submits Code of Fair Competition

The American Iron and Steel Institute on July 14 submitted to the National Recovery Administration for approval a code of fair competition on behalf of the operators of plants for the production of pig iron, iron or steel ingots and rolled or drawn iron or steel products, assented to by 90 per cent of the total steel ingot capacity of the United States. The code provides for a 15 per cent increase in wages, a 40-hour work week and minimum rates of pay for common labor ranging from 35 to 40 cents an hour. The code also includes a list of practices declared to be "unfair practices."

OBITUARY

Charles W. Hanford of the general sales department of the Ingersoll-Rand Company, New York, and for more than 20 years in the service of that company, died suddenly on July 11, at his home in New York, at the age of 59.

C. D. Pettis, president of the Continental Brake Shoe & Equipment Company, died in New York City on July 9, after a short illness. Mr. Pettis had served in the car departments of the Southern Railway, the Illinois Central, the St. Louis-San Francisco and Swift & Company. He then became associated with C. M. Hewitt in the Featherstone Foundry & Machine Company, in Chicago, later being connected with the National Brake Shoe Company. He then went with the American Brake Shoe & Foundry Company and in 1922 at the time of his resignation he was vice-president and works manager. Mr. Pettis had been president of the Continental Brake Shoe & Equipment Company since its formation in 1926.

Financial

CHESAPEAKE & OHIO.—*Acquisition.*—The Interstate Commerce Commission has authorized this company to acquire and operate the lines and other properties of the following subsidiaries: Ashland Coal & Iron Ry., Big Sandy & Kentucky River Ry., Iron Creek R. R., Long Fork Ry., Millers Creek R. R., Pond Fork & Ball Knob R. R., Sandy Valley & Elk Horn Ry. The C. & O. owns all the outstanding stock and bonds of these subsidiaries and the plan is to reorganize its interest in them by acquiring the properties for the nominal consideration of $1, to assume their liabilities and bring about their dissolution, canceling their stock and bonds. The lines concerned have a total length of 145.3 miles. The securities of these companies were purchased by the C. & O. at a total cost of $14,958,138.

COLORADO & WYOMING.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a branch line extending from Primero Junction, Colo., to Primero, 2.6 miles.

COOS BAY SOUTHERN.— *R. F. C. Loan Denied.*—Division 4 of the Interstate Commerce Commission has denied approval of this company's application to the Reconstruction Finance Corporation for a loan of $75,000 to complete the construction of an extension of 5.5 miles in Coos county, Ore. Division 4 also has denied the company's application for a certificate authorizing the construction.

ERIE.—*R. F. C. Loan.*—The Interstate Commerce Commission has revoked its certificate of April 29, approving a loan of $1,500,000 from the Reconstruction Finance Corporation, on the ground that the necessity for the loan no longer exists because the company had received on May 1 a loan of like amount from the Railroad Credit Corporation for the same purposes.

GRAND TRUNK WESTERN. — *Trackage Rights.*—The Interstate Commerce Commission has authorized this company to operate over 3.9 miles of the Pennsylvania in Muskegon, Mich., and over 3.2 miles of the tracks of the Muskegon Railway & Navigation Company in the same vicinity—the purpose being to secure access to the new Grand Trunk water terminal on Muskegon Lake.

PENNSYLVANIA.—*Repayment on R. F. C. Loan.*—This company has made an additional payment of $9,000,000 on its loan of $27,500,000, in addition to $9,500,000 previously paid.

ST. LOUIS-SAN FRANCISCO.—*Reorganization Plan.*—Hearings were begun on July 18 before O. E. Sweet, director of the Bureau of Finance of the Interstate Commerce Commission, on a reorganization plan for this company submitted under the provisions of the recent amendment to the bankruptcy law. The plan is that proposed last year in an effort to avert

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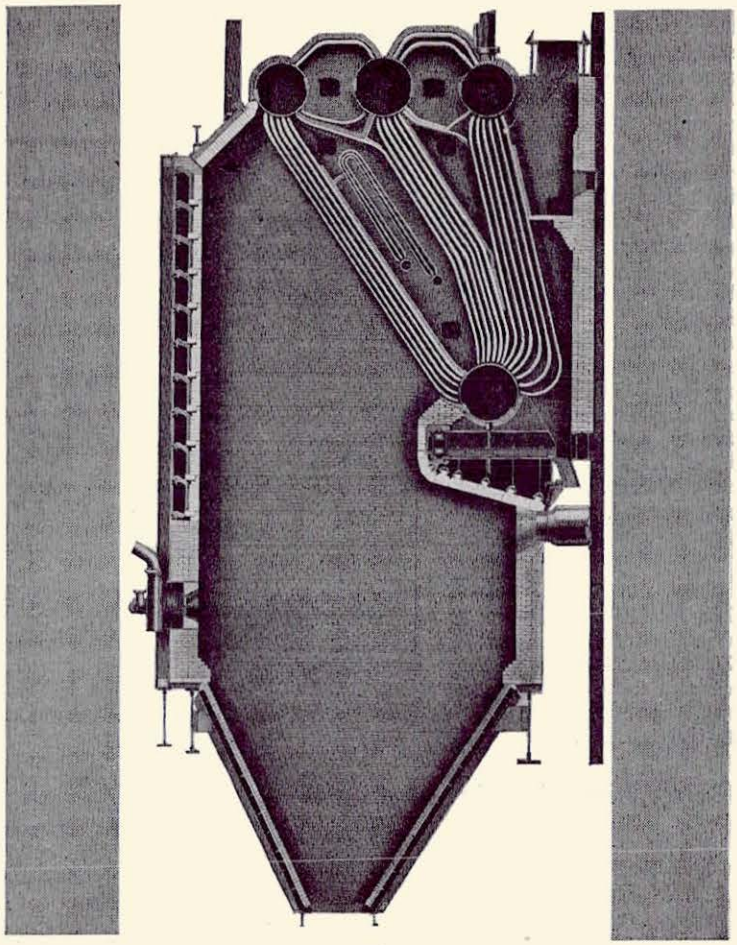
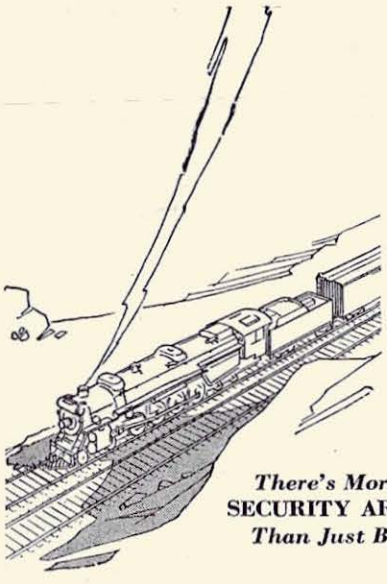
A typical installation of six 2,000 H. P. boilers fired with a combination of blast furnace gas and pulverized coal, equipped with American Sectionally-Supported Air Cooled Walls and Suspended Arches.



INDUSTRY, *too* Has Its ARCH Problems



There's More to SECURITY ARCHES *Than Just Brick*

AMERICAN Arch Company's reputation as combustion specialists has spread thru all industry.

Heating furnaces in the country's greatest steel plants have roofs designed by American Arch Company experts.

Oil still arches and air-cooled side walls by American Arch Company are used in the leading oil refineries. The largest units in the world are so equipped.

Boiler furnaces have turned to American Arch Company for air-cooled side walls and arches, including the biggest units of any railroad power plant.

Everywhere throughout industry combustion problems of this nature are being brought to American Arch Company.

Meanwhile, the railroads are still getting this counsel as part of the complete service on Arch brick that is rendered by American Arch Company.

AMERICAN ARCH COMPANY

INCORPORATED

NEW YORK CHICAGO

receivership, after the commission had declined to approve further loans to the company from the Reconstruction Finance Corporation until a plan was proposed for reducing its fixed charges, but it is now being opposed by many banks, insurance companies, and the R. F. C., that have filed intervening petitions, on the ground that, inasmuch as the company has since gone into receivership, a more drastic plan is now required. The R. F. C., through its counsel, took the position that the plan is not logical, that it does not comply with the commission's suggestions for a reduction in the fixed charges and in the proportion of funded debt to stock nor provide adequately for the floating debt, and that a plan should now be formulated which shall consider a consolidation with the Chicago, Rock Island & Pacific, as proposed in the commission's consolidation plan.

SEABOARD AIR LINE.—*Abandonment.*—The Interstate Commerce Commission has authorized this company and the East & West Coast Railway and their receivers to abandon that part of the line of the latter company extending from a point near Manetee, Fla., to Arcadia, 45.7 miles.

Average Prices of Stocks and of Bonds

	July 18	Last week	Last year
Average price of 20 representative railway stocks..	51.35	49.39	12.87
Average price of 20 representative railway bonds..	75.34	73.76	51.04

Dividends Declared

Cleveland, Cincinnati, Chicago & St. Louis.—$5.00, semi-annually; Preferred, $1.25, both payable July 31 to holders of record July 21.

Hudson & Manhattan.—5 Per Cent Preferred, $2.50, payable August 15 to holders of record August 1.

Kansas City, St. Louis & Chicago.—6 Per Cent Preferred, 1½ per cent, quarterly, payable August 1 to holders of record July 19.

Michigan Central.—25c, payable July 31 to holders of record July 21.

Mine Hill & Schuylkill Haven.—$1.50, payable August 1 to holders of record July 15.

Shamokin Valley & Pottsville.—$1.50, semi-annually, payable August 1 to holders of record July 15.

* * *

On the Delaware & Hudson

Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

W. D. Cool has been appointed auditor of the Colorado & Wyoming, with headquarters at Pueblo, Colo., succeeding **F. H. Wilmsmeier,** deceased.

TRAFFIC

Howard E. Simpson, general eastern passenger agent of the Baltimore & Ohio, with headquarters at New York, N. Y., has been placed in charge of passenger traffic in the New York district succeeding **E. D. Ainslie,** deceased.

E. W. Clapp and **H. A. Hinshaw,** general passenger traffic manager and general freight traffic manager, respectively, of the Southern Pacific, Pacific Lines, with headquarters at San Francisco, Cal., will retire on August 1. These positions will be abolished.

Paul D. Freer, has been appointed freight traffic manager of the Baltimore & Ohio, with headquarters at Baltimore, Md., succeeding **Samuel House,** deceased, and **C. H. Pumphrey** has been appointed freight traffic manager at Cincinnati, Ohio, succeeding Mr. Freer. **A. L. Doggett** has been appointed freight traffic manager at Pittsburgh, Pa., succeeding Mr. Pumphrey.

W. F. Murray, traffic manager of the St. Louis Southwestern, with headquarters at Tyler, Tex., has been promoted to the newly-created position of general traffic manager, with headquarters at St. Louis, Mo. Mr. Murray will succeed to the duties formerly handled by **John R. Turney,** who has resigned as vice-president in charge of traffic to become director, section of freight service, on the staff of the federal co-ordinator of transportation at Washington, D. C. **C. H. Jennings,** general passenger agent at Tyler, has been appointed to the newly-created position of general freight and passenger agent, with the same headquarters, in which position he will continue to discharge his former duties as well as those relinquished by Mr. Murray. **H. F. McCarthy,** assistant to the vice-president in charge of traffic, has been appointed to the newly-created position of assistant general traffic manager, with headquarters as before at St. Louis.

Mr. Murray has been connected with the Cotton Belt for about 32 years. He was born on October 7, 1881, at Bloomington, Ill., and entered railway service in June, 1901, as a record clerk on the Cotton Belt in Texas. Later he was advanced through the positions of stenographer, rate clerk, chief rate clerk and chief clerk. In June, 1910, he became chief clerk in the traffic department of the Missouri-Kansas-Texas of Texas at Dallas, Tex., returning to the Cotton Belt in the following year as a general agent in the freight department. In February, 1912, he was promoted to assistant general freight agent, with headquarters at Tyler, being further advanced to general freight agent at the same point on March 1, 1920. In December, 1927, Mr. Murray was promoted to freight traffic manager of the lines in Texas, with headquarters at Tyler, and two years later he was advanced to traffic manager at Tyler, with jurisdiction over the entire system. He was holding the later position at the time of his recent appointment as general traffic manager.

W. F. Murray

J. J. Kavanaugh, general agent on the Missouri Pacific, with headquarters at Chicago, has been promoted to the newly-created position of assistant traffic manager, with the same headquarters. Mr. Kavanaugh has been connected with the traffic department of the Missouri Pacific for 26 years. He first entered the service of the company as a soliciting freight agent at Chicago and in May, 1907, he was sent to Monroe, La., as a commercial freight agent. On October 1, 1911, he was advanced to general agent with headquarters at Salt Lake City, Utah, where he remained until January 1, 1928, when he was transferred to Chicago. Mr. Kavanaugh then occupied the position of general agent at Chicago until his recent promotion to assistant traffic manager.

J. J. Kavanaugh

MECHANICAL

The headquarters of **D. J. Mullen** and **J. A. Brossart,** superintendent of motive

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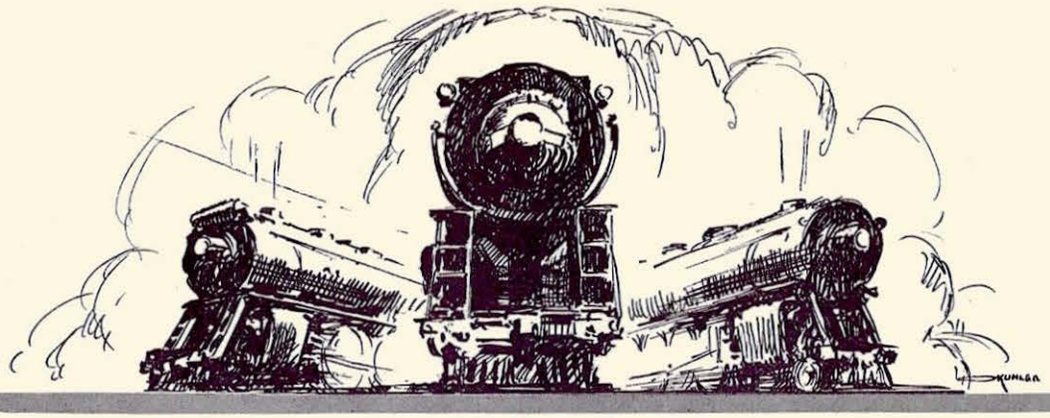

AMERICAN LOCOMOTIVE CO.

SOMETHING MORE TO THINK ABOUT . .

TRAFFIC is increasing rapidly.

For **nine** consecutive weeks, car loadings have exceeded the weekly totals of the corresponding period in 1932.

The holiday week ending on July 8th had 29.6% more car loadings than the similar week last year.

To get YOUR SHARE of the increase, present day fast schedules must be maintained.

30 CHURCH ST., NEW YORK, N. Y.

power and superintendent of rolling stock, respectively, of the Cleveland, Cincinnati, Chicago & St. Louis, will remain at Indianapolis, Ind. It was erroneously reported in the *Railway Age* of July 15, page 140, that the headquarters of these officers would be moved to Cincinnati, Ohio.

PURCHASES AND STORES

A. C. Mann, vice-president in charge of purchasing of the Illinois Central, with headquarters at Chicago, has been appointed also purchasing agent. **J. J. Bennett,** purchasing agent has been appointed assistant purchasing agent to succeed **L. C. Guernsy** who has retired.

OPERATING

William M. Gordon, general superintendent, Lines West, of the Canadian Pacific Express Company, with headquarters at Winnipeg, Man., has retired after 48 years of continuous service with this company.

C. M. Williams, assistant superintendent of the Cleveland division of the New York Central, has been promoted to superintendent of the same division, with headquarters as before at Cleveland, Ohio, to succeed **W. H. Sullivan,** deceased. **G. H. Jedele,** trainmaster on the Cleveland division, has been appointed assistant superintendent of that division, with headquarters as before at Cleveland, to succeed Mr. Williams.

Thomas M. Hayes, assistant to the receiver of the Wabash, has been appointed to the newly-created position of assistant general manager, with headquarters as before at St. Louis, Mo. Mr. Hayes was born at Morrisonville, Ill., and after a public school and business college education, entered railway service in 1903 as a trackman on the Wabash. After two years he became a clerk to a track supervisor, later being appointed a stenographer in the division engineer's office. In 1909 Mr. Hayes was promoted to traveling secretary to the president, serving in this position until 1924, when he was made assistant to the president. His title was changed to assistant to the receiver in 1931, when the Wabash was placed in receivership. Mr. Hayes is also assistant secretary of the Toledo & Western.

Thomas M. Hayes

OBITUARY

W. H. Sullivan, superintendent of the Cleveland division of the New York Central, with headquarters at Cleveland, Ohio, died on July 9 at Cleveland.

George F. Sheer, assistant general passenger agent of the Baltimore & Ohio, with headquarters at St. Louis, Mo., died in a hospital at Columbus, Ohio, on July 19.

Albert S. Johnson, executive general agent for the Missouri-Kansas-Texas, with headquarters at Oklahoma City, Okla., and formerly general manager of the Northern Lines of this company, died on July 6 following a heart attack. Mr. Johnson was 65 years old and a native of Florida, Mo. He first entered the service of the Katy in 1886 and served as an operator and agent at various points until 1889 when he left the service. Mr. Johnson returned to the Katy in 1912 as superintendent at Denison, Tex., and after serving in this position at various points he was appointed general manager of the Northern lines, with headquarters at Parsons, Kan., in 1920. From February, 1922, until July, 1923, he served as superintendent at Waco, Tex., then being appointed executive general agent at Oklahoma City, which position he held until his death.

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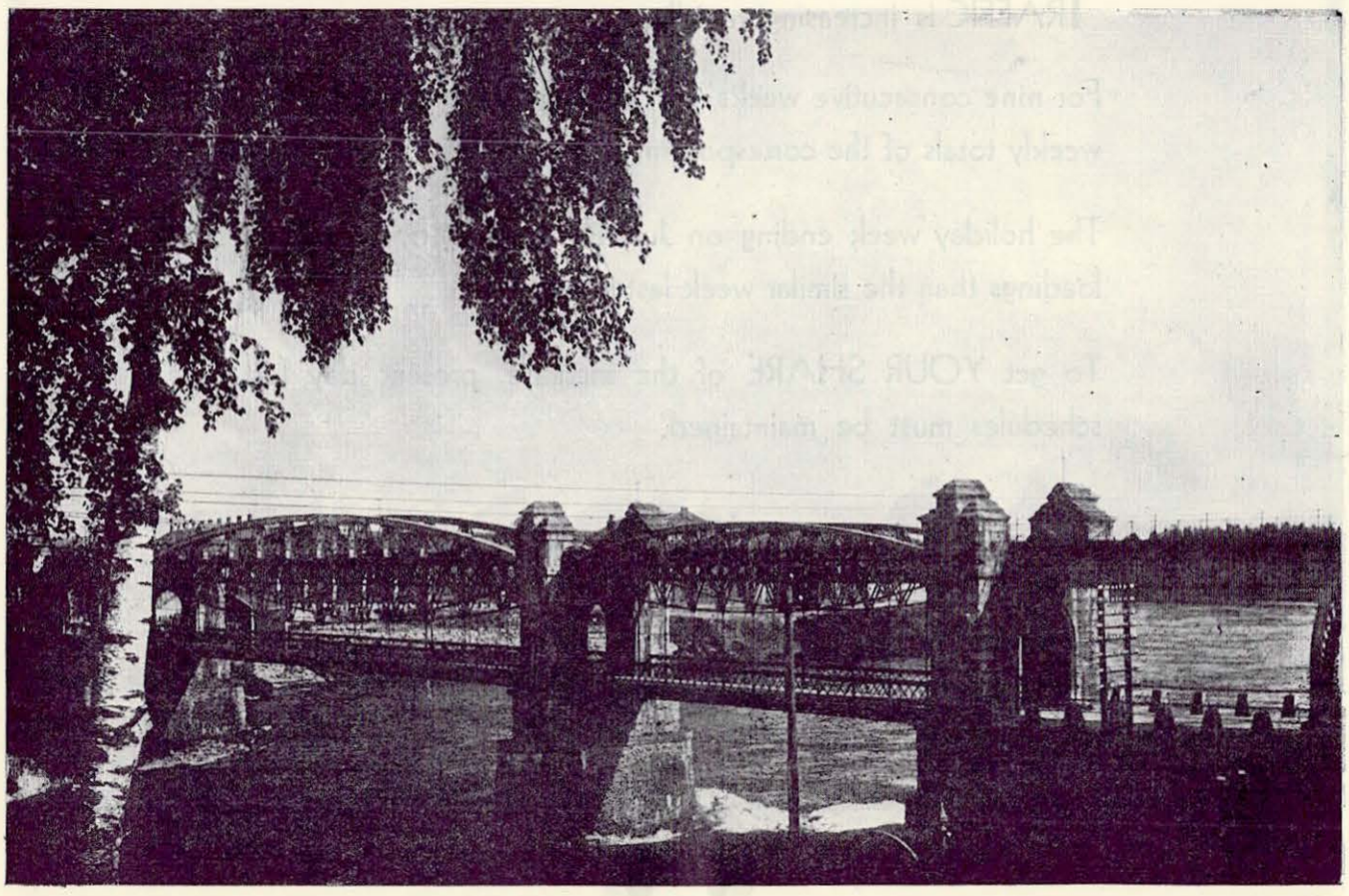
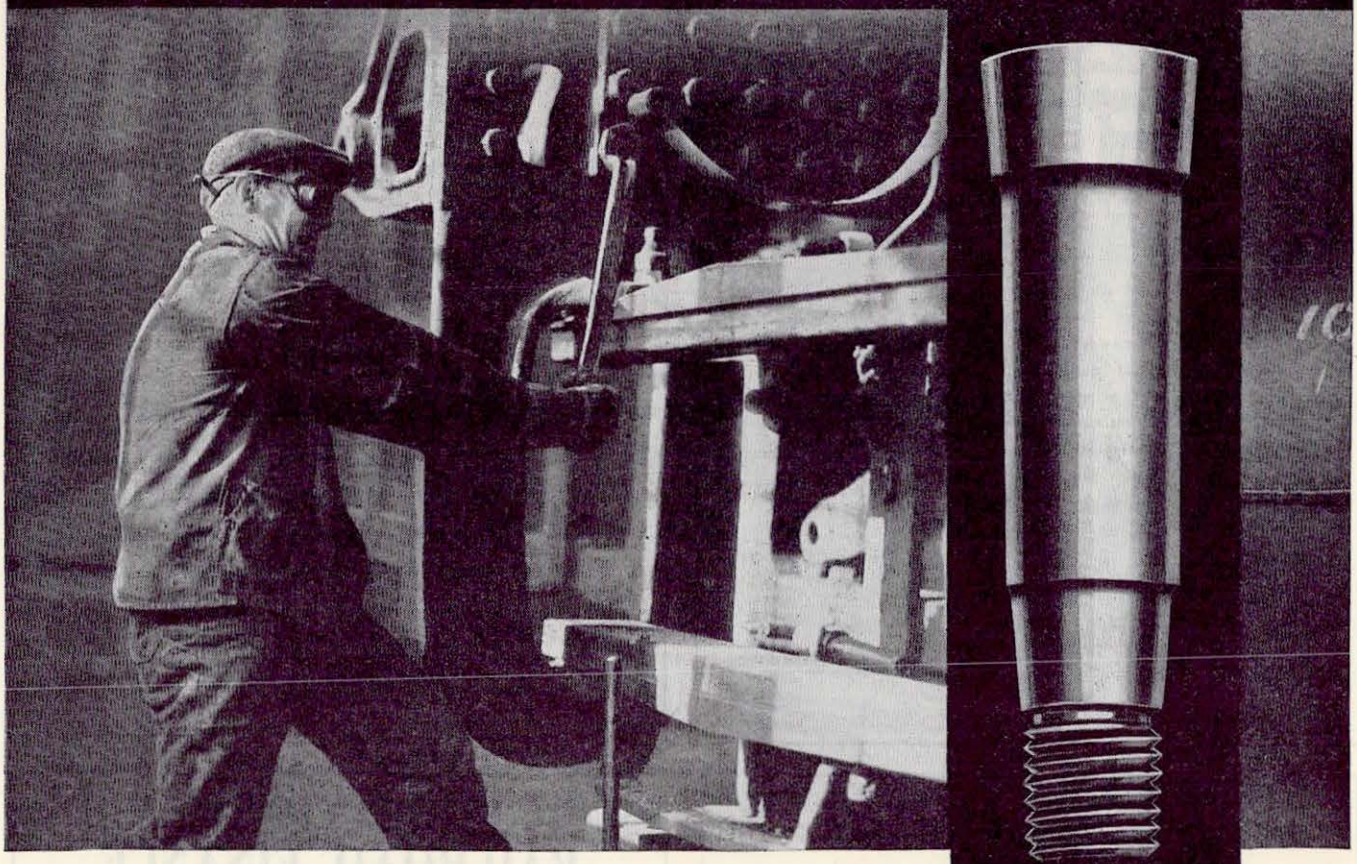


Railway and Road Bridge at Sarpsborg, Norway

A STRETCHING BOLT IS A START TOWARDS THE SHOP



When engine bolts stretch, when slack gets a chance to accumulate, locomotives are started on the road that leads to the repair shop. » Forces that rack the locomotive have increased in violence as locomotives have increased in power. » The old material that once served for engine bolts is unable to restrain these greater forces. » But Republic metallurgists have kept abreast of the new conditions and in Agathon Engine Bolt Steel have developed a material with high elastic limit, free from seams or slag pockets and possessed of great fatigue resistance. » You can safely trust Agathon Engine Bolt Steel to keep parts tight under the most difficult operating conditions.

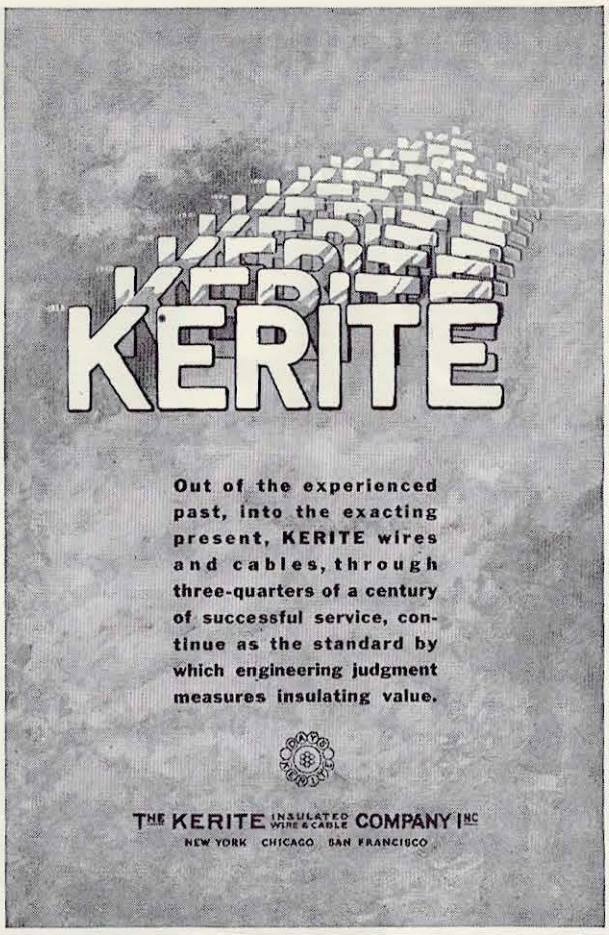
Toncan Iron Boiler Tubes, Pipe, Plates, Culverts, Rivets, Staybolts, Tender Plates and Firebox Sheets • Sheets and Strip for special railroad purposes • Agathon Alloy Steels for Locomotive Parts • Agathon Engine Bolt Steel • Agathon Iron for pins and bushings • Agathon Staybolt Iron • Climax Steel Staybolts • Upson Bolts and Nuts • Track Material, Maney Guard Rail Assemblies • Enduro Stainless Steel for dining car equipment, for refrigeration cars and for firebox sheets • Agathon Nickel Forging Steel.

CENTRAL ALLOY DIVISION . . . MASSILLON, OHIO

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO

AGATHON STEELS


KERITE
Out of the experienced past, into the exacting present, KERITE wires and cables, through three-quarters of a century of successful service, continue as the standard by which engineering judgment measures insulating value.
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MAGNUS COMPANY
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AND
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New York Chicago

REGULATION OF RAILROAD FINANCE
By
John H. Frederick, Ph. D.,
Frank T. Hypps, Ph. D.,
and
James M. Herring, Ph. D.
Instructors in the Wharton School of Finance and Commerce; University of Pennsylvania

Regulation of the financial affairs of railroads by the Federal government through the Interstate Commerce Commission, under the Transportation Act of 1920, is clearly explained in this book. The various tests applied by the Commission in determining the elements of public interest to which the statute usually refers are traced, together with the nature and reasons for the Commission's action in regulating the financial affairs of the railroads.

Contents

Introduction—Certificates of Public Convenience and Necessity for Construction and Abandonment of Railroads—The Acquisition of Control of Carriers—The Recapture of Excess Earnings—The Issuance of Securities and Assumption of Obligations—Interlocking Directorates—Appendices: Provisions of the Interstate Commerce Act Administered by the Finance Bureau of the Interstate Commerce Commission — New Railroad Construction — Abandonments—Bibliography—Index.

225 pages, tables, 6x9 inches, cloth, $3.50

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Simmons-Boardman Publishing Company
30 Church Street, New York

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Freight Car Door Fixtures
Corrugated Steel Freight Car Doors
CAMEL SALES COMPANY 332 South Michigan Avenue CHICAGO, ILLINOIS

For Complete Alphabetical Index to Advertisers see page 24

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1,300,000 cars equipped
ROLLER SIDE-BEARINGS
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WINE RAILWAY APPLIANCE CO.
TOLEDO, OHIO
Details of our products appear in following issues of Railway Age during 1932
January 16—March 19—May 21—August 13—September 17—November 19—or Railway Mechanical Engineer.

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Your professional card should appear in this section

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Non-Display "Employment" Ads five cents a word. Count address in figuring cost. Box number requires ten words. All other classified Ads $4.00 an inch (1" x 1⅝") an insertion. Payable in advance. Railway Age, 30 Church St., New York, N. Y.

WANTED

GOING concern of good financial and business standing with entrees to Railroad and Transportation Companies in the State of TEXAS to handle in that territory, on strictly commission basis, old established Specialty in the Railroad and Transportation fields. Address Box 881, RAILWAY AGE, 30 Church St., New York, N. Y.

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R. W. BIXBY, Inc.
102 Delward Bldg., Buffalo, N. Y.

EDUCATIONAL

THE Railway Educational Bureau, Omaha, Neb., offers a distinctive education service for Supervisors and other employes. Write for FREE Special Bulletin.

Index to Advertisers

July 22, 1933

A

American Arch Co., Inc. 19
American Locomotive Co. 20
American Steel Foundries 3
Armco Railroad Sales Co., The 13

B

Baldwin Locomotive Works, The 8
Bixby Inc., R. W. 23
Burroughs Adding Machine Co. 4

C

Camel Sales Company 23
Classified Advertisements 23

E

Edgewater Steel Co. 2

F

Franklin Railway Supply Co., Inc. 18
Frigidaire Corporation 14

G

General Railway Signal Co. 10, 11
Get Together Department 23

H

Harbison-Walker Refractories Co. 19
Hunt Company, R. W. 23
Hunt-Spiller Manufacturing Corp. 26
Hutchins Car Roofing Co. 16

K

Kerite Insulated Wire & Cable Co. 22

L

Lima Locomotive Works, Inc. 17

Mc

McConway & Torley Corp. 22

M

Magnus Company, Inc. 22

P

Professional Directory 23
Pullman Car & Manufacturing Corp. 12

R

Railway Educational Bureau, The 23
Reading Iron Company 15
Republic Steel Corp. 21

S

Simmons-Boardman Publishing Co. 22
Standard Car Truck Co. 23

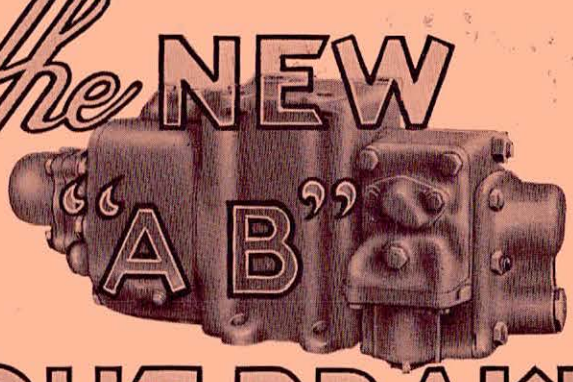
U

Union Switch & Signal Co. 6, 7

W

Westinghouse Air Brake Co. 25
Westinghouse Electric & Manufacturing Co. 9
Wine Railway Appliance Co. 23

The NEW "AB" FREIGHT BRAKE



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